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THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 1. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"HIC ET UBIQUE."—*(The Motto of No. 84 Squadron.)*

OVER THE SHATT-EL-ARAB:—No. 84 Squadron, R.F.C., was formed early in 1917 and went to France in September, 1917, under the command of Major (now Wing Cdr., R.A.F.) W. Sho'to Douglas, M.C., D.F.C., and equipped with S.E.5as. The Squadron was disbanded in January, 1920, and re-formed in August, 1920, as a Unit of the Mesopotamian Wing, Middle East Area, and stationed at Shaibah, Basrah. It is now equipped with D.H.9as.

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THE AEROPLANE

VOL. XXXIV. No. 1.

Incorporating
Aeronautical Engineering

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON THE FUTURE OF FLYING—SERVICE AND CIVIL.

[Being an Address delivered by C. G. Grey to the Cambridge University Aeronautical Society and the Cambridge University Air Squadron on Wednesday, Oct. 26, 1927.]

PART I.

Any speaker on an aeronautical subject in these days has one great advantage over those unhappy people who tried to make the British Nation air-minded before the outbreak of War in 1914. The audience of to-day is at any rate convinced that aeroplanes do fly and are reasonable vehicles of transport, needing only to be made somewhat safer and more reliable to be preferable to ordinary land and water transport, because they are faster and more comfortable.

Before the War the great majority of the people in the World had never seen an aeroplane and a great majority of people even in this country did not believe that aeroplanes would ever be of use to the general public. Probably one is right in assuming that of this audience the majority cannot even remember a time when there were no aeroplanes. Consequently one has the advantage of addressing an audience which is at any rate with one to the extent of agreeing that flying has a future.

Let us then discuss not so much what that future is to be but how that future is to be reached. There is no need for any kind of a prophet to say broadly what flying is going to do. say, a hundred years hence. Every human being who has ever thought about flying from the beginning of human intelligence has been able to prophesy in that direction.

Every Race's legends are full of winged horses and magic carpets. And apparently in every religion angels and Gods have had wings, or at any rate the means of transporting themselves through the air. And so have devils.

The legends of the Dark Ages which have come to us from mediæval times have plenty of stories of monks and men who have actually tried to fly And the earliest scientific experimenters have written of their schemes for air navigation.

To-day we are still scheming in exactly the same way to get the greatest possible distance in the shortest possible time. Having achieved high speeds, our next object is to achieve safety.

SAFETY LAST AND FIRST.

You will notice that the desire for safety always comes after the desire for speed. Your true sportsman on the road is always much more concerned about the speed of the car about which he is haggling with some motor-coper than he is about the trustworthiness of its steering or whether it has adequate brakes. The desire to live dangerously always seems to exceed the desire to die comfortably.

In this connection one perhaps may now safely tell a story out of school.

Probably most people now are aware that recently a team of British aviators, thanks to the Air Ministry, won an International Contest for a thing called the Schneider Trophy, the winning of which depended entirely on the speed of the machines.

Before the speed contest began we knew we had the fastest machines but we assumed rightly that our gallant opponents had machines of almost equal speed and reliability. Therefore to make sure of winning it was necessary for our people to eliminate every possible cause of failure.

For safety's sake aero-engines are equipped with all kinds of indicating instruments to show that the engine is operating properly. There are thermometers to show that the water and oil do not rise above certain safe temperatures. There are flow indicators, just as there are on any car, to show that the oil is circulating properly. And on these special racing machines there are one or two other gauges and gadgets connected with the engine which do not occur on a car.

Naturally there is always a possibility of one of those gadgets or indicators bursting or of one of its joints or pipelines breaking somewhere between the engine and the indicator. And each of those is a possible cause of breakdown.

Consequently, having proved in practice during the days before the contest that oil and water temperatures and circulation pressure and so forth were right, those who were responsible for the machines in the contest calmly plugged up all the holes in the engines connecting to all those indicators, removed all those possible causes of trouble, and left the pilots to fly on faith.

In one way it was a desperate thing to do. In the other it actually made for safety.

In this contest, as most of you probably know, our winning machine was certainly travelling at 300 miles an hour on the straights. It was in fact the only vehicle which had ever conveyed a human being at five miles a minute. That figure seems to give us a kind of jumping off point for our discussion.

WINTER SPORTING.—An Armstrong-Whitworth Argosy and a Handley Page W.10, belonging to Imperial Airways, in unusual surroundings at Croydon.

705673

Miles and Minutes.

It is a curious thing that in transport vehicles there seems to be some definite relationship between minutes and miles in round figures.

Our fastest trans-Atlantic liners travel at or about two minutes to the mile.

A mile a minute seems to be the high-water mark for a long-distance run by train.

120 miles an hour seems to be the aim for the cruising speed of commercial aircraft.

180 miles an hour is at present about the aim of present-day designers of war machines, either single-seat fighters or two-seat General Purpose machines.

240 miles an hour was exceeded for the first time as a World's Speed Record in 1923. (Actually the figure was 266 m.p.h.) And now we have added another mile a minute to that.

It is almost an axiom, at any rate in the early days of any method of locomotion, that the record speed of to-day is the ordinary travelling speed of to-morrow.

That holds good up to a point, but obviously there is a limit of speed which can only be reached by specially built or specially tuned vehicles. And the ordinary travelling speed must always remain a good deal below that.

For instance, nobody is going to pretend that the ordinary travelling speed of a motor-car is ever going to be the 200 miles an hour which Major Segrave alone among motorists has reached.

But all the same, there is no reason why, when this country really constructs proper motor roads along the lines of the old Roman roads, and when the police take to trapping murderers instead of motorists, our travelling speed by car should not be 100 miles an hour.

That is regarded as quite an ordinary speed on the great motor road between Milan and Varese.

Maximum Flying Speeds.

Flying is still so young compared with motoring that one does not imagine that 300 miles an hour is anything like so near the limit of flying speed as 200 miles an hour is to the limit of motoring speed.

Highbrowed scientists, of the kind who proved mathematically some thirty years ago that it was impossible for a man to fly, and proved equally mathematically that it was impossible for a steamship to carry enough coal to cross the Atlantic—and published the calculations just after a steamship had done it—are now prepared to prove, also mathematically, that speeds of anything you like between 500 m.p.h. and 1,000 m.p.h. are possible. The apostate is always apt to become the too zealous apostle.

Their calculations show that if you can get to a height of somewhere between 40,000 and 50,000 feet the air is so thin that it offers practically no head resistance, and almost any speed can be reached.

The pilot and passengers must be enclosed in an airtight cabin fed with oxygen and maintained at atmospheric pressure. The aeroplane must be driven by a supercharged and probably artificially fed engine. In fact it sounds like a very uncomfortable form of locomotion.

Personally one would be well content to travel at a mere four miles a minute or so within seeing distance of the ground,—apart from the fact that hedge-hopping is the most amusing method of flying.

Therefore one proposes to leave out of this discussion these purely hypothetical scientific aircraft and to limit one's prophecies to what we know can actually be done.

Three years ago the American Bellanca monoplane, with a 200 h.p. Wright Whirlwind engine, of the type in which Mr. Chamberlin was so thoughtless as to bring Mr. Levine to Europe, carried four passengers and the pilot, with fuel for 3½ hours, at a speed of 130 miles an hour.

That is quite a good travelling speed. A stage of 3½ hours without getting out of one's machine is quite as much as anybody wants. Unless you are actually in a sleeping car you do not care much about travelling more than 3 hours by rail without getting out to stretch your legs on a platform.

And the Americans showed us all that time ago that this performance can be got at 40 horse power per passenger, including the pilot as a passenger in this case.

We have been in the habit of carrying eight passengers and a pilot at about 120 miles an hour with 450 h.p. That is less speed with rather less range, for 50 h.p. per passenger.

Our big three-engined machines are a shade less economical. The best of them has a top speed of about 130 miles an hour and carries 20 passengers and a pilot and mechanic for 1,350 h.p., or about 60 h.p. per passenger—though in this case one must admit that the machine carries a good deal more than that in actual load in the form of goods, as there is no possibility of getting more passengers into the cabin.

Unfortunately most of the multiple-engined machines in the World are a very long way from being as efficient as that, so that we are considerably behind that old American monoplane in mere efficiency. And 130 miles an hour is a long way below what we have a right to regard as the travelling speed of the future.

Paying for Speed.

Everybody in these days knows that if you want speed you have got to pay for it.

Naturally we are still a long way from having the absolutely perfect streamline, and probably we shall be able to get quite a good deal more speed, especially at the very high speeds, out of improving the actual surface of our machines so as to reduce skin friction.

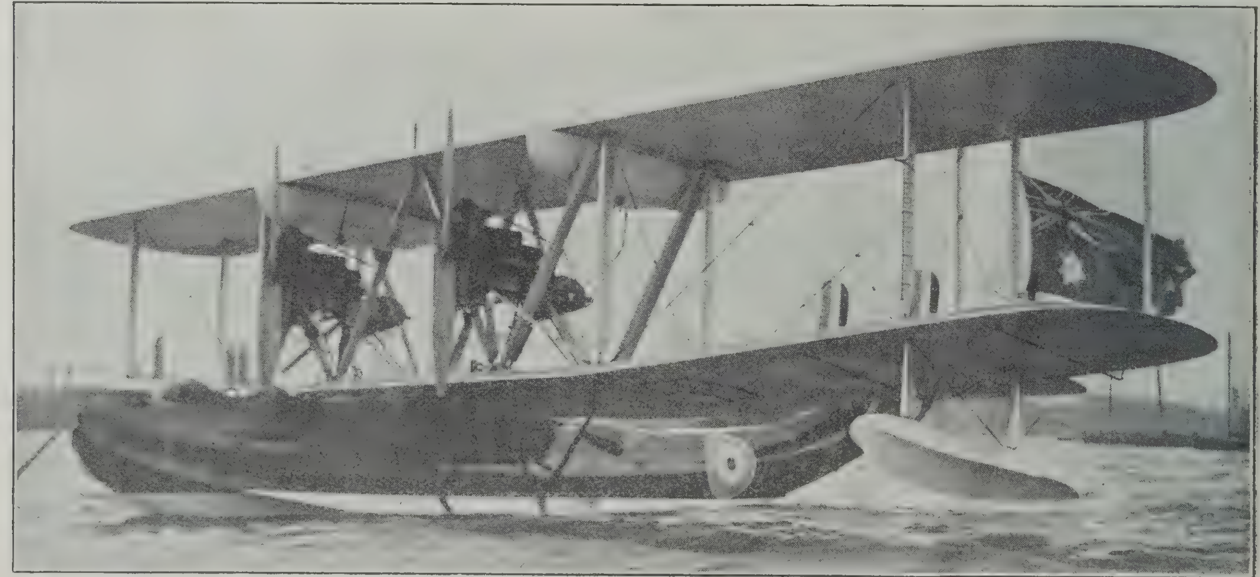
But at the finish we have still got to pay for speed.

That is shown by the fact that our Schneider Trophy winner needed something very close to 1,000 h.p. to do five miles a minute. And the little de Havilland Tiger-Moth needs somewhere about 130 h.p. to carry one small man at 200 m.p.h.,—although that 130 h.p. is got out of an engine which, according to the R.A.C. rating on which we are all so unjustly taxed, only gives 32 h.p.

Fortunately there are hopes that we may still get quite a lot more speed out of our machines even with engines of existing types.

In America some three years ago Doctor Lewis of the American Advisory Committee showed one an experimental wind tunnel in which they got a speed of some 90 miles an hour or so with the air compressed to three atmospheres, which they reckoned produced much the same effect as an ordinary wind tunnel with an air speed of about 250 to 300 m.p.h.

In that wind tunnel they discovered that at high speeds, that is to say, from 200 miles an hour upwards, the air which



AUSTRALIAN CO-OPERATION.—A Supermarine Southampton (two 450 h.p. Napier Lion engines) belonging to the Royal Australian Air Force, two of which will fly from Australia to Singapore and there join up with the R.A.F. Far East Flight.

"THE Far East Flight of four metal-hulled Supermarine 'Southampton' flying boats, each fitted with two Napier Lion engines, has now completed one quarter of its itinerary of 25,000 miles. Such an ambitious journey has never been attempted by the service aircraft of any nation, and the flight has kept regularly to its schedule. Flying in formation, the boats crossed the Syrian desert, using the Euphrates near Baghdad as one of their halts. Group-Captain H. M. Cave-Browne-Cave said that the flight thus far had been very satisfying. They had had no trouble of any kind."

The Times, 19th Nov., 1927

40,000 *engine miles so far.*

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is hit by the aeroplane is so compressed that it is much cheaper for the aeroplane to cut its way through it than it is to displace it and let it flow back over a streamlined trailing edge.

That piece of knowledge was what helped the Americans to get such terrific speed out of the last lot of racing machines which they built for the Schneider Seaplane Trophy and for the Pulitzer Land Plane Trophy contests so far back as 1923.

We in this country still have a great deal to learn in that direction. As one has already said in print, one of our Schneider Trophy machines had sharp cutting edges and certain other qualities which undoubtedly increased its speed. The other had a more perfect streamline, but no cutting edges. Which seems to account for the fact that their speeds were almost the same.

Mr. Mitchell, the designer of the winning Supermarine, told one that he could see several ways in which the speed of his winning machine could be improved. Consequently we may look forward to speeds of somewhere about 360 m.p.h. (six miles a minute) as a quite possible record speed. And so we may look to something around 240 m.p.h. as a reasonable travelling speed for aircraft of the future, whether civil or military.

ENGINE DEVELOPMENT.

In talking of these speeds one is reckoning on the use of ordinary internal combustion engines as we know them today. Possibly somebody may in time to come discover some entirely new form of power plant.

We may acquire an internal combustion turbine. Apparently there is no difficulty about making such a turbine work. The only difficulty is preventing the working parts of the turbine from melting when working as they would be in a stream of flame.

And, of course, there is always the possibility that we may some day have wireless distribution of power and we may be able to fly in aeroplanes which pick up useful power from a central broadcasting station as easily as we pick up the useless stuff which emanates from 2LO.

But neither the turbine-driven aircraft nor the wireless machine need trouble our present considerations. The existing four-stroke or two-stroke engine will probably last out our time.

Nevertheless, we should be unfair to our present engine designers if we thought that they had reached the limit of their ingenuity. When flying began seriously some seventeen or eighteen years ago aero-engines weighed anything between 4 and 8 lbs. per horse power.

To-day we have got them down to 1 lb. per horse power, and there seems a reasonable possibility of getting them down to about half that.

In the early days, and until quite recently, we thought that the right speed at which to run an airscrew was somewhere between 1,000 and 1,500 r.p.m., and engines were limited to that rate. Within recent years, with the advent of metal airscrews, people have begun to think about running screws at speeds up to about 3,000 r.p.m.

But our most startling performances, such as those of the 300 m.p.h. Supermarine, and of those two astonishing two-seaters, the Fairey IIIF and the de Havilland Hound have been got by gearing down big airscrews to run at something like the old 1,500 r.p.m. rate and running the engines up a great deal faster.

The ordinary Napier Lion engine as used on Service and civil machines gives about 450 h.p. at 2,000 r.p.m. The specially boosted engine in the Supermarine was given something very close to 1,000 h.p. at something over 3,000 r.p.m.

It is true that that engine was only calculated to last for a couple of hours' flying at that power before breaking down, but there is every reason why improvements in metals should permit the building of an engine to give that power at that rate with as much reliability as the slower and heavier engines of to-day.

Judging by motor-car standards there is nothing extraordinary about 3,000 r.p.m. The other day at Brooklands one heard a racing driver remark that he had never been full out because he had never let his engine out beyond 6,000 r.p.m.

If the advocates of high-speed airscrews are right then the high-speed engine will go a long way towards helping the production of light high-speed aeroplanes. But if we still have to stick to the big slow-running airscrews the advantage of the high-speed engine is considerably discounted by the fact that it will have to be geared down in a ratio of probably 6 to 1, which means very heavy gearing unless, again, somebody invents some new principle of gearing.

However, cutting out all these possibilities, the 240 mile-an-hour aeroplane is not a very long way ahead, if one takes a line through the Schneider Trophy winner and the Tiger-Moth and the 130 mile-an-hour passenger machines, and the ordinary light aeroplane such as the Moth and the Avian and the Widgeon and Bluebird doing their hundred miles an hour or so on 80 h.p.

One is not going to suggest for a moment that within the next few years 240 miles an hour is going to be an ordinary touring speed for aeroplanes. But we do know that if it is worth while we can produce aeroplanes which will do 240 miles an hour and keep on doing it for a good many hours at a stretch. So what is going to make it worth while?

C. G. G.

(To be continued.)

MR. C. G. GREY.

Mr. C. G. Grey, who met with a serious accident on Dec. 21, is making satisfactory progress.

The fractured thigh has been set and although Mr. Grey is suffering from the tedium of inactivity, and is adjusting his organism from a vertical to a horizontal position, he is comparatively comfortable

"THE DAILY TELEGRAPH" AND BRITISH AVIATION.

The sale by Lord Burnham of *The Daily Telegraph* to the powerful syndicate controlled by Sir William and Sir James Berry and Sir Edward Iliffe is a matter of considerable interest to the Aeronautical Community, for the future policy of this important paper may well have far-reaching influence on British Aviation.

From the earliest days of flying *The Telegraph* has continually done good work. So far back as one's memory goes—to 1908—the air affairs of *The Telegraph* have been in the hands of Mr. C. C. Turner (later Major, R.A.F.), and on no occasion can one remember his taking a wrong or wild view on anything concerning flying. One may perhaps have criticised some of his views in detail, but on broad principles and essential policy he has been impeccably sound and wholly sane.

Backed by Lord Burnham's money, and instigated by Mr. Turner's intimate knowledge of the internal politics of British Aviation, *The Telegraph* has done far more to promote real progress in flying than have most other papers, some of which have been more concerned in spending money to advertise their own aeronautical activities than in helping aeronautics. There is a vast difference between consistently advertising flying through the influence of a great paper and merely advertising a paper by means of a sudden boost of a big flight or two.

Mr. Turner, besides being one of the earliest pilots in this country, was a famous balloonist before flying began. He is, one believes, about the sole survivor of that gallant party who left London by balloon and landed in the Steppes of Russia before any aeroplane flew. And among his more recent adventures will be remembered *The Daily Telegraph* flight to Central Africa, which ended unhappily with the breaking of the machine in the air near Khartum.

While so many papers have treated Aviation as a mere subject for sensational journalism, and have ignored all phases of flying which did not provide "heart interest," the healthy and practical way in which *The Telegraph* has handled the subject has been of the highest value to genuine progress and to making airminded the better-class business people to whom that paper particularly appeals. One can only hope that it may continue its good work.

Happily, there is little prospect of its doing otherwise. The new proprietors are eminently good business men. The brothers Berry made a success of *The Sunday Times* years ago. And Sir Edward Iliffe, as head of *The Autocar* group of papers, is fully alive to the possibilities of air transport.

To Sir Edward Iliffe, and the late Walter Staner, the great editor of *The Autocar* in the days when motoring was establishing its place in the World, one owes one's first connection with the Writing Trade, and under them, four years later, one started the old blue-covered *Aero*, which some old-timers still remember with affection. THE AEROPLANE came into being only because *The Aero* became a monthly instead of a weekly publication. Therefore one owes Sir Edward various debts of gratitude, and one hopes sincerely that under the new arrangement *The Telegraph* and its able aeronautical specialist, Mr. Turner, may do even greater work for British Aviation than they have done in the past.

C. G. G.

"THE CANADIAN AIR REVIEW."

The R. H. Bedell Publishing Co. Ltd., of Toronto, Canada, are about to produce the first Canadian Aviation publication to be known as *The Canadian Air Review*. The first number of the journal, which will be a monthly one, will appear this month, and in view of the present position of aviation in Canada it should be an excellent advertising medium for all British aircraft, engine and accessory manufacturers.

The R. H. Bedell Publishing Co. have a London office at Excel House, Whitcomb Street, W.C.2, which office will be glad to supply any details concerning the new publication and at the same time will be pleased to receive any editorial information from the British trade concerning their products.

PRODUCTION

As the result of the adoption of the Fairey IIIF by the British Air Ministry as well as by Colonial and Foreign Governments, the Fairey Aviation Company are now producing the General Purpose and Fleet Air Arm types of this aircraft in large quantities. This building activity is the result of producing a high performance aircraft capable of undertaking the varied requirements of the Royal Air Force (including both its Naval and Military spheres of operation) and to fulfil these requirements without loss of performance.

The Fairey Aviation Company, Limited,
Hayes, Middlesex.

FAIREY
AIRCRAFT

THE ROYAL AIR FORCE IN 1927.

The beginning of 1927 in the Royal Air Force was marked by the promotion of the Chief of the Air Staff, to the rank of Marshal of the Royal Air Force, the highest rank in the Service.

Empire Defence.

At the end of January a detachment of officers and men of the R.A.F. proceeded to China to supplement the R.A.F. Unit in H.M.S. *Hermes* in view of the trouble which had arisen in that country. A Command known as the R.A.F., China, was formed with Headquarters at Hong Kong under Group Capt. E. D. M. Robertson, D.F.C., Fleet Aviation Officer to the Commander-in-Chief, China, and included Units of the Fleet Air Arm in H.M. Aircraft Carriers *Hermes, Argus,* in H.M.S. *Vindictive,* and H.M.S. *Enterprise* and at Hong Kong and Kaitak Aerodromes. In April No. 2 (Army Co-operation) Squadron from Manston under Sq. Ldr. William Sowrey, D.F.C., A.F.C., sailed in s.s. *Neuralia* to join the Shanghai Defence Force. No. 2 Squadron returned in October by which time the situation in China had become more settled.

In October the Far East Flight under Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., left Cattewater for a cruise of 23,000 miles before taking up its station at Singapore. The Flight is equipped with Supermarine Southamptons (Napier Lion engines) and at the time of going to press is ahead of its programme. The object of the cruise is to gain experience in the problems involved in the reinforcing of points on the Imperial routes.

In August and September the R.A.F. undertook a successful flying-boat cruise of the Baltic ports. The boats taking part were the Blackburn Iris (three 650 h.p. Rolls-Royce Condor engines), the Short Singapore (two 650 h.p. Rolls-Royce Condor engines), the Saunders Valkyrie (three 650 h.p. Rolls-Royce Condor engines), and a Supermarine Southampton (two 450 h.p. Napier Lion engines). The Secretary of State for Air flew as a passenger in the Blackburn Iris as far as Copenhagen for the opening of the Aero Exhibition. The Iris brought him back to Felixstowe and subsequently rejoined the cruise at Stockholm.

In October a Flight of three Fairey III.F machines (Napier Lion engines) under Wing Cdr. F. W. Stent, M.C., left Heliopolis to fly to Kano and back on Service exercises. The Flight met with various misfortunes and only one machine survived to complete the programme.

Home Defence.

The reorganisation of Home Defence started in 1926 has been continued during the past year. A new Group has been formed known as No. 1 Air Defence Group under Air Commodore E. L. Gerrard, C.M.G., D.S.O., with Headquarters at Sloane Street, London, S.W. The Units in this Group include the Auxiliary Air Force Squadrons and the Special Reserve Squadrons. New Station Headquarters have been formed under the Air Defence of Great Britain at Upper Heyford, at North Weald, at Hawkinge and at Biggin Hill during the year. A new Squadron, No. 10 (Bombing) Squadron, has been formed at Worthy Down under the Command of Wing Cdr. H. R. Busteed, O.B.E., A.F.C., and is being equipped with Handley Page Hyderabads (Napier Lion engines). No. 56 (Fighter) Squadron has moved from Biggin Hill to the new station at North Weald and No. 99 (Bombing) Squadron has moved from Bircham Newton to the new station at Upper Heyford.

The War-time aerodrome at Boscombe Down, Wiltshire, which has been in use as a night-landing ground has been re-built and will be used to accommodate one or more Bombing Squadrons in 1928.

The first annual tactical exercises of the Air Defence of Great Britain took place at the end of July and involved all the organisation of the Fighting and Bombing Areas, R.A.F., and the Ground Forces of the London Defences. For the purposes of these exercises the Bombing Area became the Enemy and succeeded in penetrating the defences put up by the Fighting Area and the Ground Forces again and again giving undeniable proof that the safety of this country from air attack depends more on its power to attack the enemy in its own aerodromes than in any defensive system, however efficient.

General Activity.

A new Squadron, No. 26 (Army Co-operation), has been formed under the Inland Area Command at Catterick, Yorkshire, and is equipped with Armstrong-Whitworth Atlas machines. No. 11 (Bombing) Squadron has been re-equipped with Hawker Horsleys and No. 13 (Army Co-operation) Squadron has been re-equipped with Altas's. No. 1 (Fighter) and No. 56 (Fighter) Squadrons have both been re-equipped with Siskins.

Abroad, No. 45 (Bombing) Squadron has been moved from Hinaidi, 'Iraq, to Helwan, Egypt, and re-equipped with D.H.9as to replace its Vickers Vernons. No. 47 (Bombing) Squadron has been moved from Helwan to Khartum and re-equipped with Fairey III.Fs to replace its D.H.9as.

In the Fleet Air Arm a new Fleet Fighter Flight has been formed at Donibristle, two new Fleet Spotter Reconnaissance Flights and two new training Flights at Leuchars and two new Fleet Torpedo Flights at Gosport.

The Eighth Annual R.A.F. Display took place at Hendon on July 2 and was a greater success than ever in spite of poor weather conditions. A number of new machines appeared in public for the first time including several of exceptional interest owing to their clean design and high performance.

The Schneider Trophy Contest was won at Venice on Sept. 26 by a Supermarine S.5 (Napier engine) piloted by an officer of the R.A.F. The entire British team entered for this contest in 1927 consisted of officers of the R.A.F. trained as a high-speed Flight at the Marine Aircraft Experimental Establishment at Felixstowe and at Calshot.

The Personnel.

There has been a small increase in the total numbers of the *personnel* over 1926. In the General Duties Branch there is one more Group Captain, eight more Wing Commanders, five more Squadron Leaders, forty-nine more Flight Lieutenants and fifteen more Pilot Officers. There was a decrease of twenty in Flying Officers. There was a slight increase in all ranks in the Medical, Stores, and Accountant Branches.

There has been a notable decrease in the number of fatal accidents during the past year. In 1926 there were over 8 deaths, but in 1927 there were only 37 fatal accidents involving the death of 54 members of the Service. These figures include one officer of the Fleet Air Arm missing, believed killed in Hong Kong, but do not include two officers of the Reserve of Air Force Officers killed during their annual training in civilian establishments.

Sports.

The R.A.F. has not had a successful year in inter-Service Sports. They were beaten by the Army and by the Navy at Rugby Football, Association Football and Hockey. They were beaten by the Army at Fencing and Golf. However they beat the Navy at Cricket, Fencing and Golf.

In the inter-Unit contests Uxbridge won the King's Cup for Athletics and the Team Fencing Challenge Cup. Sealand won the Air Council Cup for Athletics for Units of a strength of less than 500. No. 58 (Bombing) Squadron won the Rugby Football Cup. Martlesham Heath won the Senior Association Football Cup and the Coastal Area Stores Unit, Tangmere, won the Junior Association Football Cup. Henlow won the Boxing Championship both for Officers and Other Ranks and the Senior Hockey Cup. Manston won the Cross-Country Senior Cup and Calshot won the Cross-Country Junior Cup and the Junior Hockey Cup.

Gosport won the Chief of the Air Staff's Cup for Rifle Shooting and Eastchurch won the Salmond Cup for Pistol Shooting.—C. M. McA.

AIR SURVEY IN INDIA.

The Air Survey Co. Ltd., of 3, Copthall Buildings, Copthall Avenue, E.C.2, announce that a contract has just been signed with them by the Director of Land Records and Survey, Bengal, for the survey and mapping on a scale of 16 miles to the inch of 1,600 square miles in the district of Malda.

This area is mostly covered with paddy-fields with well defined boundaries. Some 1,680 control points—as far as possible situated at angles of aisles between fields—will be fixed by a ground party, and by using modern methods of plotting a very high order of accuracy in the resulting maps will be attained.

Headquarters and aerodrome for this survey will be at Mathrapur, where only a few trees have had to be removed to provide landing and taking-off room, and temporary buildings for housing aircraft staff and for photographic work are being erected.

D.H.9 aircraft fitted with Eagle cameras will be used for this survey.

The particular purpose of this survey is the periodical revision of the settlement survey, on which some considerable volume of taxation is based, and it has been found in the past exceedingly difficult to secure accurate location of the boundaries of individual holdings.

This particular difficulty will certainly be overcome by aerial photography, and if the results of this particular piece of work are as satisfactory as is expected it is almost certain that all future revision surveys in India will be made by aerial methods.

SYDNEY—WELLINGTON.

Two officers of the New Zealand Air Force Reserve, Capt. Hood and Lieut. Moncrieff, are preparing to make an attempt to fly from Sydney to Wellington in a Ryan Brougham monoplane (200 h.p. Wright Whirlwind engine). The machine is at present at Point Cook for test and will shortly proceed to Sydney to await suitable weather conditions.

The attempt, which will be financed by private subscription, has been sanctioned by the New Zealand Government and every assistance is being given by the Royal Australian Air Force.

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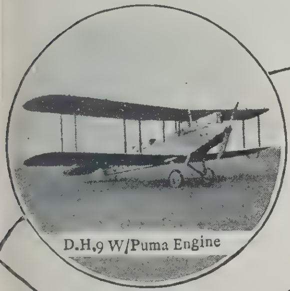
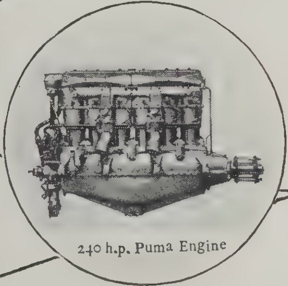
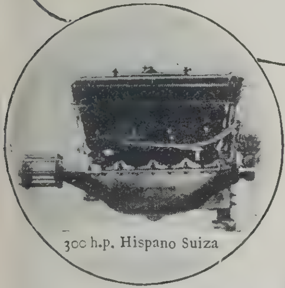
Aerial View of A.D.C. Works at Croydon.


D.H.9 W/Puma Engine


240 h.p. Puma Engine

Avro type, 504K.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THE ROYAL AIR FORCE.

Appointments.

Week ending Jan. 2.

GENERAL DUTIES BRANCH.—Squadron Leaders E. D. Atkinson, D.F.C., A.F.C., to R.A.F. Depot, Uxbridge, 2/1. L. F. Forbes, M.C., to No. 2 Arm. Car Coy., Palestine, 16/12. R. S. Lucy, A.F.C., to No. 10 Sqdn., Upper Heyford, 10/1.

Flight Lieutenant A. J. Elliott, to Air Ministry (Department of the Air Member for Supply and Research), 1/1.

Flying Officers (Hon. Flt. Lt. G. M. E. Gifford, to H.Q., Coastal Area, 2/1. G. B. Collet, to Electrical and Wireless School, Flowerdown, 3/1.

MEDICAL BRANCH.—Flight Lieutenants G. J. Griffiths, to R.A.F. Station, Bicester, 28/12. D. B. Smith, M.B., to Station H.Q. and Storage Section, Andover, 28/12.

STORES BRANCH.—Flight Lieutenant T. S. James, to No. 2 Stores Depot, Altrincham, 19/12.

The New Year Honours.

The New Year Honours List contains the following awards in the Royal Air Force :—

ORDER OF THE BATH :—*C.B. (Military Division)* Dowding, Air Commodore Hugh Caswall Tremenheere, C.M.G., R.A.F.

AIR FORCE CROSS :—Flt. Lts. Charles Roderick Carr, D.F.C., and Robert Linton Ragg.

AIR FORCE MEDAL :—127878 F-S. (Pilot) Francis Hubert Pelham Simpson, M.M.; 335127 Sjt. (Pilot) David Kinnear.

Air Commodore H. C. T. Dowding, C.M.G., is Director of Training at the Air Ministry. He was born in 1882 and educated at Winchester and Woolwich. He entered the Royal Artillery in 1900. He learned to fly on a Vickers biplane at Brooklands, and his Royal Aero Club Certificate No. 711 is dated Dec. 20, 1913. He transferred to the R.F.C. in 1914 and was awarded the C.M.G. in 1918, for distinguished services during the War.

The Half-Yearly Promotion List.

GENERAL DUTIES BRANCH.

GROUP CAPTAINS TO BE AIR COMMODORES.—Andrew George Board, C.M.G., D.S.O., John Adrian Chamier, C.B., C.M.G., D.S.O., O.B.E.

WING COMMANDERS TO BE GROUP CAPTAINS.—Henry Le Marchant Brock, D.S.O., Napier John Gill, C.B.E., M.C., Joseph Herbert Arthur Landon, D.S.O., O.B.E., James Bevan Bowen, O.B.E.

SQUADRON LEADERS TO BE WING COMMANDERS.—John Valentine Steel, O.B.E., John Arthur Gerald De Courcy, M.C., Alexander Francis Anderson Hooper, O.B.E., Robert Peel Willock, Edward Arthur Beckton Rice, M.C., Thomas Edward Barham Howe, A.F.C.

FLIGHT LIEUTENANTS TO BE SQUADRON LEADERS.—Horace George Bowen, M.B.E., Sturley Philip Simpson, M.C., Geoffrey Hornblower Cock, M.C., Arthur Gordon Jones-Williams, M.C., Tilden Chrismas Thomson, Franz Workman, M.C., Victor Reginald Scriven, A.F.C., Hugh Leedham, Philip Hildersley Cummins, D.F.C

FLYING OFFICERS TO BE FLIGHT LIEUTENANTS.—Robert John Montgomery-Moore, Frank Woolley, D.F.C., James Charles Belford, Eric Charles Delamain, M.C., Charles Alexander Cornelius Fidler, D.C.M., Walter Reginald Day, Robin Howard Haworth-Booth, D.F.C., William Henry Golder, D.S.M., Claude McClean Vincent, D.F.C., William Labat Payne, John Leslie Wingate, Edward Enos Arnold, D.F.C., Victor Hugh Clift, Alfred Harold Love, Narbrough Hughes D'Aeth, Cecil George Hancock, Dennis Caldwell Prance, Cuthbert John Collingwood, Bertram William Trelawney Hare, George Anthony Fielding Bucknall, John Simon Leslie Adams, Gilbert Harcourt Smith, Eric Scott Burns, Arthur Francis Scroggs, Henry Adelbert Anson, Stuart Douglas Scott, Robert Henry Horniman, John Brayne Lynch, Cyril Beresford Wincott, Clift Neil Charles Dickson, A.F.C., Robert Cecil Wansbrough, Charles Harold Brill, John Marsh Burd, M.C., James Noel Douglas Anderson, Harry Gayton Kirkman (Hon. Flt. Lt.), Archer Robert Prendergast (Hon. Flt. Lt.), Vyvyan John Somerset, Thomas (Hon. Flt. Lt.), Herbert Roy Bond Howell (Hon. Flt. Lt.), Ernest Cecil Barlow, George Holroyd Mills, Reginald Newnham Waite, Walter Joseph Martin Akerman, Arthur Pethick Revington, Malcolm Bruce Mackay, Roland Arthur Ross Mangles, David William Frederick Bonham-Carter, Frederick George William Mitchell, William Arthur Darville Brook, Colin Logan Falconer, Gerard Combe, Thomas Joseph Desmond, John Gosset Hawtrey, John Charles Eric Arnott Johnson (Hon. Flt. Lt.), Percy Ivor Vincent Rippon (Hon. Flt. Lt.), Leonard Young, Robert Kennedy Emerson, John Vincent Kelly, Edgar Henry Douglas Spence (Hon. Flt. Lt.), Alfred Haines.

LIEUTENANT, R.N., FLYING OFFICER, R.A.F., TO BE FLIGHT LIEUTENANT.—Edward Michael Conolly Abel-Smith.

STORES BRANCH.

SQUADRON LEADER TO BE WING COMMANDER.—Cuthbert Leopold Archbold.

FLIGHT LIEUTENANT TO BE SQUADRON LEADER.—George Frederick Law.

FLYING OFFICERS TO BE FLIGHT LIEUTENANTS.—Raymond Hugh Latham, Ernest Richard Wood, Frederick William Todd.

ACCOUNTANT BRANCH.

FLIGHT LIEUTENANTS TO BE SQUADRON LEADERS.—Algernon Wynn Pendennis Phillips, O.B.E., Charles Henry Moore.

FLYING OFFICERS TO BE FLIGHT LIEUTENANTS.—William Joseph Heneghan, Walter William Deane, William Edward Victor Richards, Robert Cecil Clayton, Harold Edmund Cardwell, A.F.C.

MEDICAL BRANCH.

WING COMMANDER TO BE GROUP CAPTAIN.—Edward Cecil Clements, O.B.E.

FLIGHT LIEUTENANT (ACTING SQUADRON LEADER) TO BE HONORARY WING COMMANDER.—John Normand MacDonald.

PRINCESS MARY'S ROYAL AIR FORCE NURSING SERVICE.

ACTING SENIOR SISTER TO BE ACTING MATRON.—Miss Janet MacLeod, A.R.R.C.

SISTER TO BE ACTING SENIOR SISTER.—Miss Gladys Taylor.

The Far East Cruise.

The Service Flying-boat Cruise of four Supermarine Southampton Flying-boats (Napier Lion) engines under the command of Group Capt. H. M. Cave-Brown-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17, reached Mangalore, Western Madras, from Bombay, on Dec. 27. Their time from Bombay to Mangalore, 450 miles, was six hours.

On Dec. 29, the Flight arrived at Cochin, Southern India.

On Dec. 31, the Flight arrived at Colombo, Ceylon

A Christmas card from the Flight to THE AEROPLANE with a coloured illustration of two Southamptons with the Flight markings flying over a tropical island, on the cover, and a map of the route of the cruise inside, has been received and bears the words "going strong."

Aircraft in Submarines.

The following extract from an Order in Council appeared in *The London Gazette* of Dec. 30 :—

We consider that provision should be made for the payment of an allowance to qualified Fleet Air Arm Pilots and Naval Observer Officers who are appointed to submarines carrying aircraft.

We beg leave humbly to recommend that Your Majesty may be graciously pleased, by Your Order in Council, to sanction, with effect from the 27th day of June, 1927, the payment of an allowance of 2s. a day to all qualified Fleet Air Arm Officers and Naval Observer Officers, who have been, or may hereafter be, appointed to submarines carrying aircraft, such allowance to be administered in the manner laid down for Submarine Allowance, except that payment shall be discontinued during any period in which the Officer in receipt of the allowance shall be absent from duty owing to sickness.

The Cranwell Inspection.

The following is taken from *The Army, Navy and Air Force Gazette* :—

Air Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., conducted the passing-out inspection of cadets at the R.A.F. Cadet College, Cranwell, on Dec. 16, and distributed the prizes. Accompanied by Group Capt. N. D. K. MacEwen, C.M.G., D.S.O., Deputy Director of Training, he was received by Air Commodore F. C. Halahan, C.M.G., C.B.E., D.S.O., M.V.O., Commandant of the College. Sir John inspected the cadets on parade, and afterwards witnessed their march past. There was no flying parade owing to the unsuitable weather, and after Sir John had inspected the workshops the prize distribution took place in the gymnasium.

The Commandant's report showed that the strength of the College was 118, of whom 25 were to pass out this term. Although bad weather interfered with flying during the year, the cadets passing

NEC ASPERA TERRENT.—The Staff of the R.A.F. Hospital, Cranwell. In the centre of the front row is Wing Cdr. W. Tyrrell, D.S.O., M.C., M.B., D.P.H., Principal Medical Officer, Cranwell, and on his right is Miss M. B. Botwood, Matron, Princess Mary's R.A.F. Nursing Service.

"LW" The record of a veteran MOTH

Captain W. J. McDonough, the Chief Instructor of the Midland Aero Club with G-EBLW.

G-EBLW was delivered to the Midland Aero Club on the 25th September, 1925, the ninth Moth with a Cirrus engine to leave the de Havilland Works.

Her Certificate of Airworthiness was issued on the 9th Sept., 1925, and renewed without a replacement being necessary on the 29th October, 1926.

She has just been overhauled and repainted for the first time since she left the Works and, even now, it has not been necessary to refabric the planes. Her Certificate of Airworthiness was again revalidated for a year on the 15th December, 1927.

As the "Solo" machine of the Midland Aero Club "LW" has flown 543 hours without a forced landing and no less than 18 pupils have taken their pilots' licences on her.

During her whole period of commission THE ONLY REPLACEMENTS used in her maintenance have been TAIL-SKID SHOES AND SHOCK ABSORBERS.

The record of "LW" is typical of the service which Moth Landplanes and Seaplanes are giving all over the World.

This statement is made with the knowledge and authority of the Midland Aero Club.

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out had averaged 78 hours' flying, of which 29 had been solo flying on Service types. Work in aeronautical engineering and science had been satisfactory. More improvement had been shown in Morse, but it was not considered that cadets, as a whole, realised the value and importance of wireless. Discipline had been good, and the health of cadets excellent.

Sir John Salmond, commenting on the report, asked the cadets to take up wireless more, because it was a very important part of their training, not only there, but in future, and without it the Royal Air Force could not function. Addressing the cadets on the importance of character and energy, he asked them not to get into a rut in their leisure, wherein lay a great snare. That rut was the grave of many a promising career.

The Sword of Honour, presented to the best all-round flight cadet in the senior term, was awarded to Flight Cadet Under Officer A. W. Hunt. The R. M. Groves Memorial Prize, for the best all-round pilot in the senior term, was won by Flight Cadet Serjeant C. E. St. John Beamish. The Abdy Gerrard Fellowes Memorial Prize, for the flight cadet obtaining the highest total marks in mathematics and science, was won by Flight Cadet Corporal E. A. Jones. The prize awarded to the flight cadet in the senior term obtaining the highest marks in humanistic subjects was won by Flight Cadet Corporal K. F. T. Pickles. The prize awarded to the flight cadet in the senior term obtaining the highest marks in aeronautical engineering was won by Flight Cadet E. R. White.

The R.A.F. Memorial Fund.

A meeting of the Executive Committee of the R.A.F. Memorial Fund was held at the offices of the Fund on Dec. 14. Lord Hugh Cecil was in the Chair.

The usual list of donations and subscriptions which had been received since the last Meeting was laid on the table and in view of the generous donations sent to the Fund by the Air Council on behalf of the R.A.F. share of the profits of the Royal Tournament held at Olympia in June last, and of the extremely good profits earned by the R.A.F. Display held at Hendon in June last, the total reached a very considerable sum, and the thanks of the Committee were forwarded by the Chairman to the Air Council for their generous help which has now extended over a period of more than seven years.

The Hon. Treasurer was given authority to invest in Trustee Securities a certain sum of money, and also was authorised to place to the Reserve Account of the Vanbrugh Castle School a further sum in view of possible improvements and enlargement of the School.

A letter received at the end of November from a firm of London Solicitors was read to the Committee by the Secretary and conveyed the wish of an Anonymous Donor to make a large contribution to the Fund in the near future, subject to the Committee submitting a suitable scheme for the use of the money. A deputation from the Executive Committee consisting of the Honorary Treasurer, Sir Charles McLeod, Bart., Air Vice-Marshal Sir Philip Game, Lieut.-Cdr. H. E. Perrin, late R.N.V.R., and the Secretary, was directed to arrange an interview with the solicitors in question and to submit a scheme for utilising the interest on the large sum concerned towards the education of the children of Officers, beginning with those who have died in the Service of the Country, whether at War, or in times of Peace.

The Committee agreed to make a grant of £20 to the St. George's Home for Officers' Children, Old Woking, Surrey, in respect to the children of officers of the Royal Air Force who are inmates of the Home.

CONTROL.—The Christmas Card of Cambridge University Air Squadron.

The Military Moth.

No. 24 (Communications) Squadron, R.A.F., is to be re-equipped with 20 De Havilland Moths (Cirrus engines). No. 24 Squadron has, up to the present, been equipped with a miscellaneous collection of Avros, Bristol Fighters and D.H.9as.

No. 24 Squadron is stationed at Northolt, and is a unit of the Fighting Area. It is commanded by Sq. Ldr. S. N. Cole.

R.A.F. SPORTS AND PASTIMES.

Boxing in 'Iraq.

The finals of the R.A.F. Novices' Boxing Championships ('Iraq), took place on Dec. 17 at Hinaidi, in the presence of the A.O.C., Sir Edward L. Ellington, K.C.B., C.M.G., C.B.E., and His Majesty the Ex-King Ali.

The contests were staged in No. 70 (B) Squadron Hangar, before a large audience, who saw a good series of bouts, the majority going the full distance and the decisions being given on points.

The conclusion of the contests resulted in Armoured Car Wing, and No. 70 (B) Squadron, tieing with 25 points each for the Airmen's Team Championship. In order to award the trophy the winner was decided on the number of fights won, the decision going to Armoured Car Wing, No. 70 (B) Squadron being runners-up.

The final airmen's team placings were as follows:—Armoured Car Wing (25 points), No. 70 (B) Sqdn. (25 points), "D" Depot Sqdn. (24 points), No. 84 (B) Sqdn. (24 points), Station H.Q. (20 points), No. 55 (B) Sqdn. (18 points), "A" Depot Sqdn. (14 points), "C" Depot Sqdn. (9 points), Air H.Q. (2 points).

The Officers' team championship was awarded to No. 70 (B) Squadron with a total of 13 points, No. 55 (B) Squadron being runners-up with 8 points.

At the conclusion of the fighting Air Vice-Marshal Sir E. L. Ellington, in a short speech, expressed thanks to those who had taken part. He commented on the excellent number of entries received, and congratulated the winners,—Armoured Car Wing, and called upon His Majesty the Ex-King Ali to present the prizes.

By kind permission of Sq. Ldr. E. R. Vaisey, the Band of the 'Iraq Aircraft Depot played during the evening.

The Referees were Col. Prescott, C.M.G., C.I.E., and Sqdn. Ldr. J. McCrae, M.B.E.

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Mess Suit	-	Made-to-Measure	12	0	0
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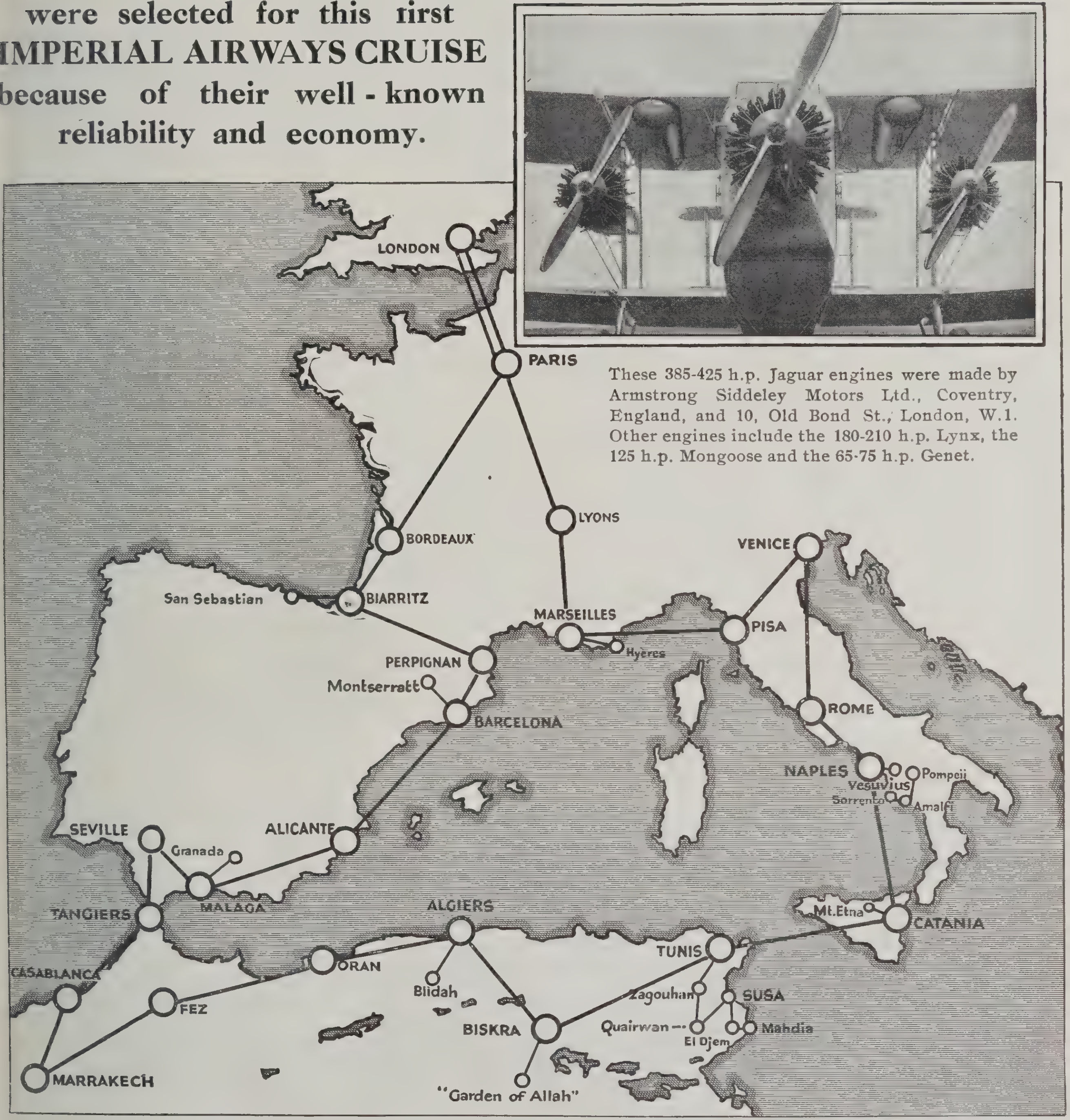


These 385-425 h.p. Jaguar engines were made by Armstrong Siddeley Motors Ltd., Coventry, England, and 10, Old Bond St., London, W.1. Other engines include the 180-210 h.p. Lynx, the 125 h.p. Mongoose and the 65-75 h.p. Genet.

ARMSTRONG SIDDELEY

A53,

TWO NEW FRENCH CIVIL MACHINES.

La Société Avimeta, of Courbevoie, near Paris, which is the aircraft department of the famous Schneider group of engineering works, has just produced two interesting commercial aeroplanes. Both machines are constructed throughout of Alferium, an aluminium alloy with qualities similar to those of duralumin, produced by the Schneider firm.

The Avimeta 92.

This is a single-engined monoplane designed to take a diversity of engines of about 200 h.p., and more particularly either the 230 h.p. air-cooled Salmson 9A.B. or the 220 h.p. Wright Whirlwind. It is fitted with a cabin for four passengers, and has a maximum speed of over 120 m.p.h., so that it may be looked on as a French reply to the many economical American commercial craft of this class.

The wing, built in one piece, is of uniform chord and section throughout, and is entirely covered with corrugated sheet Alferium. It is attached directly to the top of the fuselage, and is braced by two pairs of inclined struts running up from the bottom edges of the fuselage to rather more than half the semi-span out from the body. Ailerons of very narrow chord run over the whole span.

Internally the wing appears to have the usual two spars, but no details of construction are available.

The fuselage is of rectangular section tapering to a vertical knife-edge aft, and is completely covered in sheet metal. The top line of the body is broken at the wing, the upper surface, from engine mounting backwards, being well below the wing chord, while the surface aft runs back from the top wing surface.

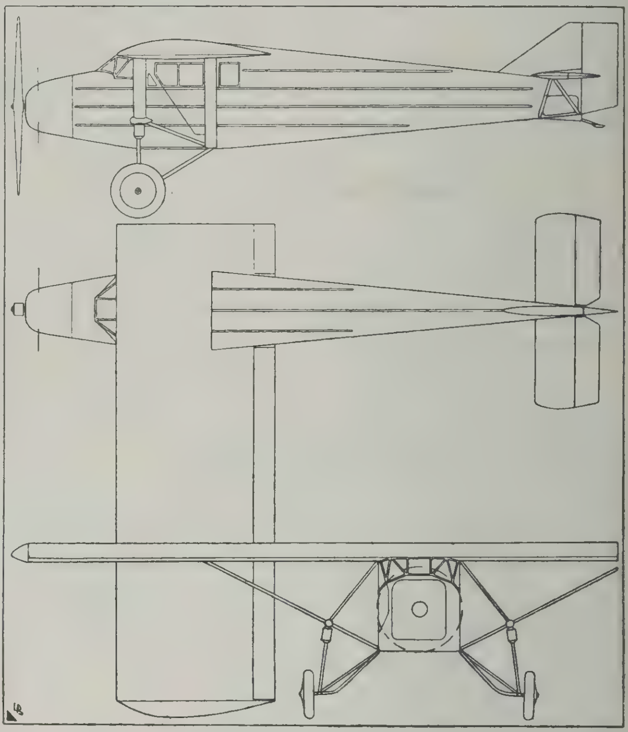
The pilot's cockpit is below the leading edge of the wing, and is protected by a sloping wind-screen, which runs diagonally upwards to the wing, and has in addition side-screens attached to it.

Below the wing is the cabin, entered by a triangular door on each side and fitted with large windows of Triplex glass, which may be raised or lowered by rotating handles. All four seats face forwards.

The tail unit is of conventional type. The tail plane and elevators are rectangular, the fin triangular, and the rudder has a horn balance. The whole unit is covered with corrugated Alferium sheet.

The undercarriage is of the split type, and is very similar to that of the Ryan Brougham. The two half-axles are hinged to the fuselage at the junction of the front spar struts with the body. A tube runs back from the end of each axle to the joints of the rear wing struts and body to take axle-thrust, and a nearly vertical telescopic leg runs up to the front wing strut.

At the point where the telescopic strut meets the wing-strut the latter is supported by a tube running down to it from the junction of the front spar with the top of the fuselage. The shock absorbers appear to be rings of rubber in compression.



The engine mounting is attached to the front of the fuselage by four bolts. On the first machine built a Salmson air-cooled engine of 120 h.p. has been fitted for test, but for actual service the Salmson 9A.B. of 230 h.p., the Lorraine-Dietrich air-cooled radial of 250 h.p. or the Wright Whirlwind, are suggested as alternatives, and interchangeable mounts are available for all these.

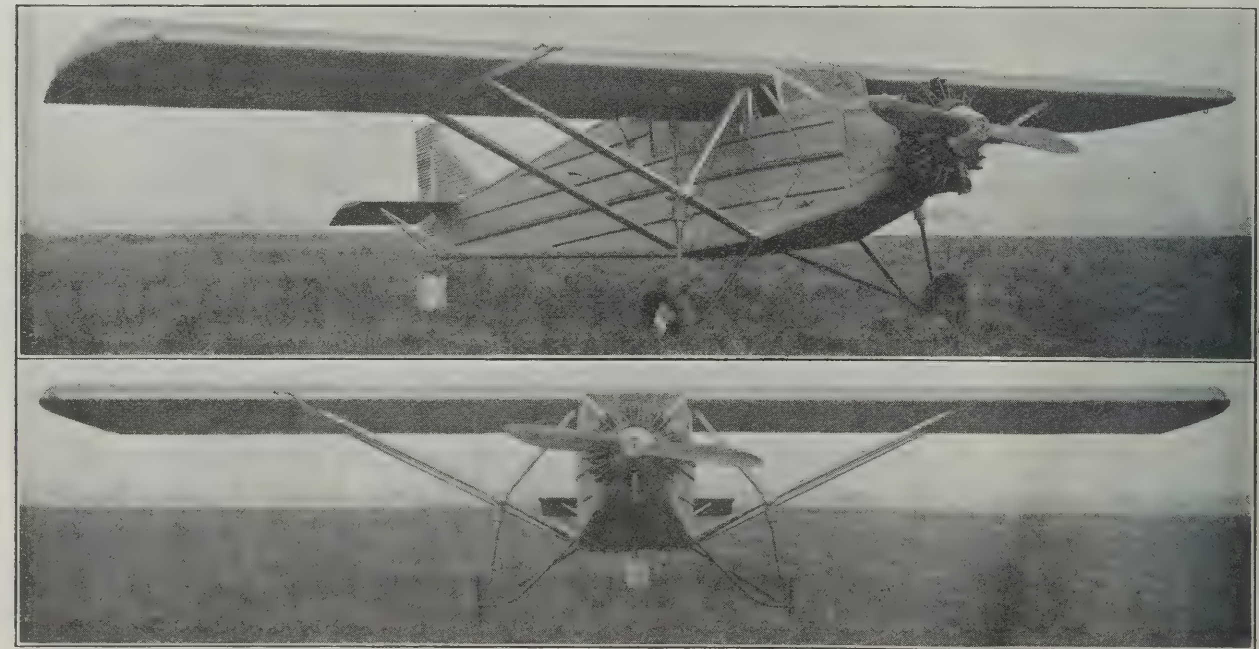
Water-cooled engines—including the Salmson C.M.9 of 260 h.p. and the 180 h.p. Hispano-Suiza—may also be fitted.

On removing the four attaching bolts, the whole engine unit, including fire-proof bulkhead, oil tank, etc., may be detached.

Two fuel tanks, of 150 litres capacity each, are carried in the wing and feed the carburetters by gravity. These tanks are made to be emptied rapidly in case of emergency.

The Avimeta 132.

This is a three-engined machine designed for engines of the same power as the machine already described, and cor-



THE AVIMETA 92.—A four-passenger all-metal monoplane just completed by the Société Avimeta. The engine fitted for test purposes is a 120 h.p. Salmson, but this will be replaced later by a 220 h.p. Wright Whirlwind.

SOME UNEQUALLED PERFORMANCES.

REGULARITY-SECURITY-ENDURANCE

LORRAINE AERO ENGINES.

Rome-Melbourne-Tokyo (54,000 km.) by Colonel de Pinedo and Campanelli (450 h.p. motor).

The Tour of Europe (7,500 km.) in 61 hours from start to finish, by Arrachart and Carol (450 h.p. motor).

Warsaw-Tokyo-Warsaw (20,250 km.) in 130 hours, by Lieut. Orlinski (450 h.p. motor).

Paris-Pekin (10,500 km.) in 6 days, by Pelletier Doisy and Carol (450 h.p. motor).

Circuit of the West Mediterranean (6,000 km.) in 41 hours 50 mins. from start to finish, by Pelletier Doisy and Gonin (450 h.p. motor).

Night Crossing of the South Atlantic, by Colonel Sarmento de Beires (450 h.p. geared motor).

Paris-Bombay-Belgrade (14,500 km.) in 89 hours flying time by Sondermayer and Baydak (450 h.p. motor).

Circuit of Eastern Europe (8,000 km.) in 7 days by Commandant Weiss and Assolant (450 h.p. geared motor).

Circuit of the Mediterranean (10,700 km.) in 6 days by Pelletier Doisy and Gonin (650 h.p. geared motor).

Michelin Cup, 1925 (Captain Pelletier Doisy), 1927 (Capt. Challes).

Breguet Cup, 1925 (Adjt. Sahuc), 1926 (Adjt. Duroyon).

King of Servia's Cup, 1926 and 1927.

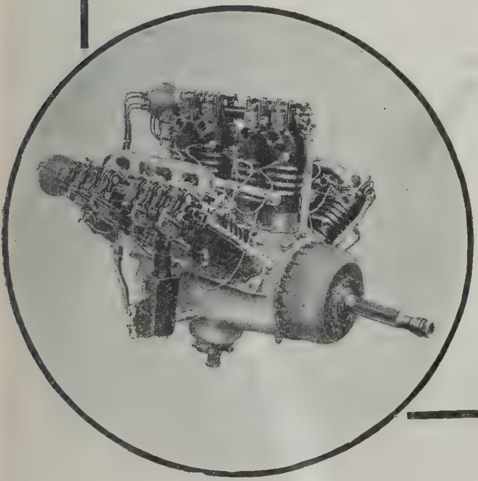
WATER-COOLED MOTORS

400 h.p. (12 cylinders in V), 450 h.p. (12 cylinders in W) direct drive and geared down.
480 h.p. (12 cylinders in W), 650 h.p. (18 cylinders in W) direct drive and geared down.

AIR-COOLED MOTORS

100 h.p. (5 cylinders radial), 230 h.p. (7 cylinders radial), 470 h.p. (14 cylinders radial).
Automobiles 12, 15 and 30 h.p. **Marine Motors**, 250 and 500 h.p. (petrol).

SOCIÉTÉ LORRAINE,



Factory:
Argenteuil (S & O)

Office:
11, Rue de Tilsitt,
PARIS.

responds roughly in capacity and performance to the Fokker F.VII-3M.

The wing tapers from body to tip both in section and in chord, and has rounded-off tips. Beyond the outboard engines it is of cantilever type. Ailerons of narrow, but taper-chord run from the body but do not extend quite to the wing-tip. The wing is covered in corrugated Alferium.

Except in size this closely resembles the fuselage of the Avimeta 92. The cockpit, seating two side-by-side, is ahead of the leading edge, but is completely roofed in by an extension past the wing of the top surface of the body. This cockpit is entirely enclosed by Triplex glass screens, but has side-windows which may be opened.

Behind the cockpit is a cabin 3.9 m. long × 1.6 m. wide × 1.8 m. high (12 ft. 10 in. × 5 ft. 3 in. × 5 ft. 11 in.), which will seat ten passengers, or alternatively may be divided into two sleeping compartments. Triplex windows which may be raised or lowered, run the whole length of the cabin.

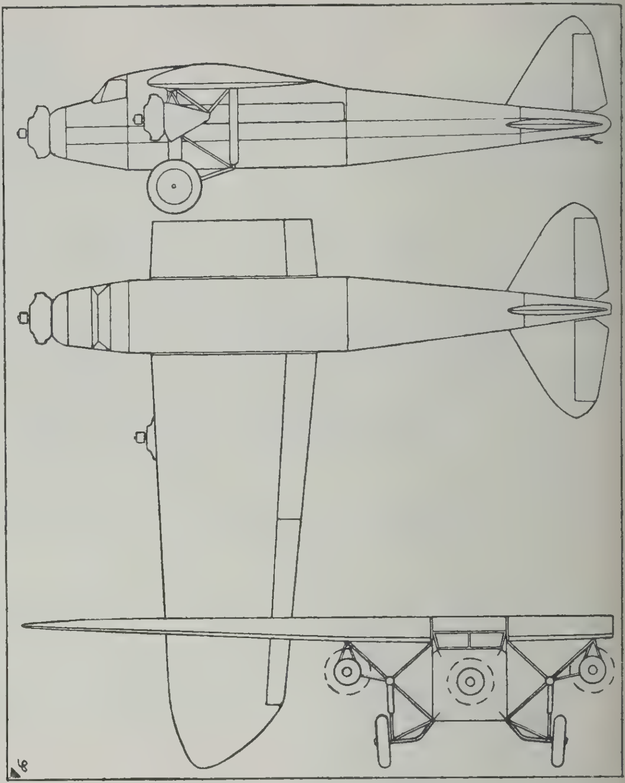
The tail unit is built up from three identical sets of components, either of which will serve as one-half of the tail plane and elevator, or as a fin and rudder. The fixed section, half tail-plane or fin, is roughly triangular in form, but has an extension which shields the tip of the movable surface. These control surfaces are balanced on inset hinges.

The undercarriage is of identical design to that of the single-engined machine.

The engines fitted to the first machine are three Salmson 9A.B. air-cooled radials of 230 h.p., but presumably the same range of alternatives could be fitted in this case as in the Avimeta 92.

The two wing engines are suspended below the junction of wing struts and wing on a tubular framing, which is stabilised by nearly horizontal struts from the junction of the undercarriage and wing struts.

Oil and fuel tanks are carried in the wings, and fuel tanks are fitted with rapid-emptying devices.

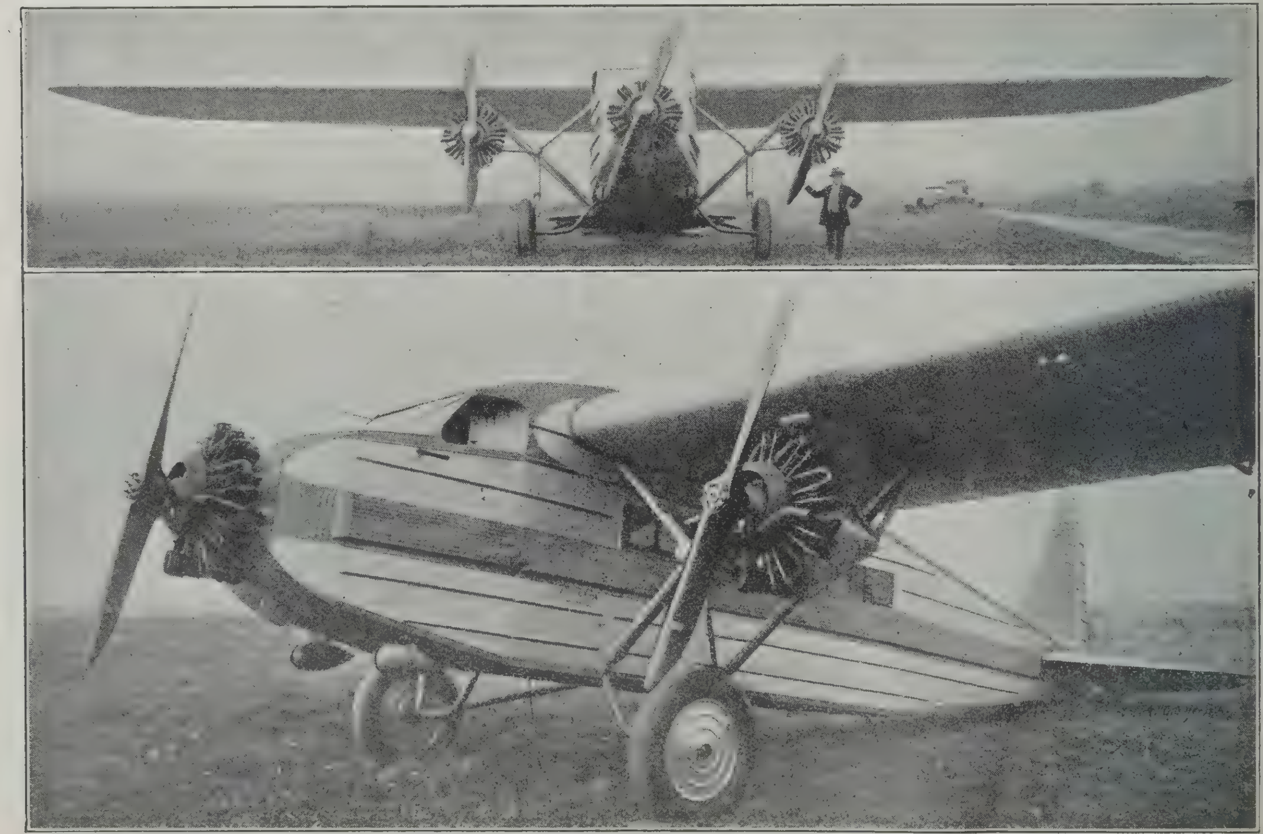


SPECIFICATION OF THE AVIMETA 92.
(With 220 h.p. Wright Whirlwind engine.)

Span	12.6 m. (41 ft. 4 in.)
Length	9.3 m. (31 ft. 3 in.)
Height	2.75 m. (9 ft. 0 in.)
Wing area ...	29.09 m. (313 sq. ft.)
Structure weight	420 kg. (924 lbs.)
Power plant weight.	325 kg. (715 lbs.)
Pilot and equipment	180 kg. (396 lbs.)
Weight empty	845 kg. (1,860 lbs.)
Pay load	320 kg. (704 lbs.)
Weight of fuel.	150 kg. (330 lbs.)
Weight loaded	1,395 kg. (3,070 lbs.)
Wing loading	48 kg./sq. m. (9.8 lbs./sq. ft.)
Power loading	6.35 kg./h.p. (13.95 lbs./h.p.)
Max. speed	200 km.h. (124 m.p.h.)
Landing speed	70 km.h. (44 m.p.h.)
Ceiling	6,000 m. (19,400 ft.)

SPECIFICATION OF THE AVIMETA 132.
(With three 230 h.p. Salmson 9 A.B. engines.)

Span	21.8 m. (71 ft. 7 in.)
Length ...	14.3 m. (47 ft. 0 in.)
Height	3.75 m. (12 ft. 3 in.)
Wing area	70 sq. m. (752 sq. ft.)
Weight empty	2,700 kg. (5,950 lbs.)
Crew and fuel	980 kg. (2,160 lbs.)
Weight loaded	4,880 kg. (10,850 lbs.)
Pay load ...	1,200 kg. (2,640 lbs.)
Wing loading	68.5 kg./sq. m. (14.3 lbs./sq. ft.)
Power loading	6.8 kg./h.p. (15.6 lbs./h.p.)
Max. speed	180 km./h. (112 m.p.h.)
Climb to 2,000 m. (6,560 ft.)	19 mins.
Range at 170 km.h. (105 m.p.h.)	900 km. (560 miles)



THE AVIMETA 132.—A three-engined all-metal commercial monoplane constructed by the Société Avimeta. The engines are 230 h.p. air-cooled Salmsons.

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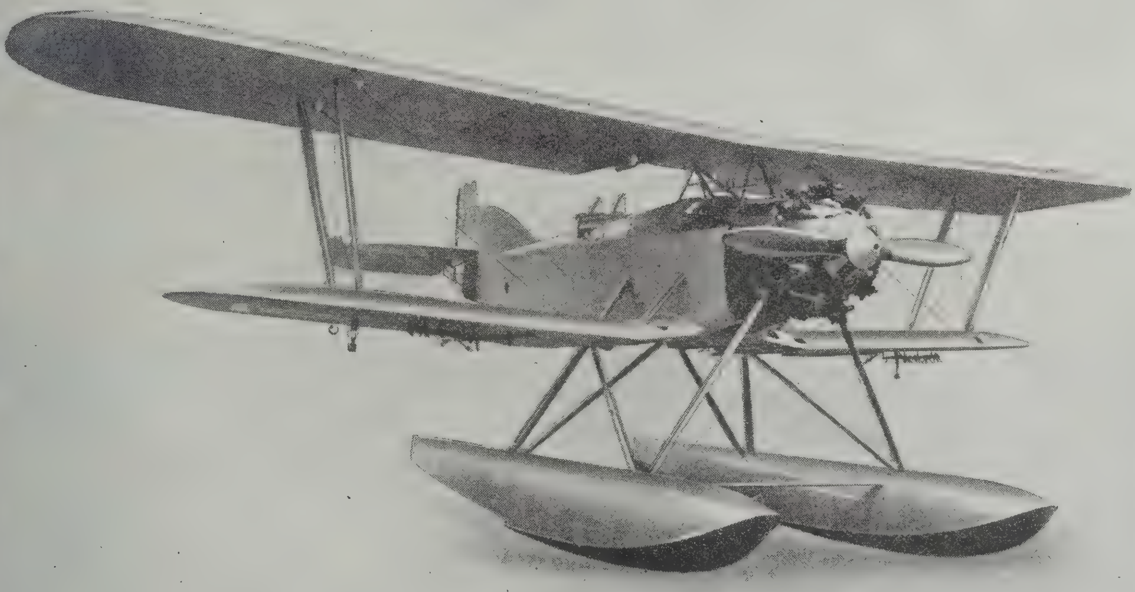


Gloster "Goring" Seaplane

THE GLOSTER "GORING" SEAPLANE is an entirely new design of two-seater seaplane, convertible to a landplane, and fitted with a 480 h.p. Jupiter engine. The machine has been designed to be used as a reconnaissance or bomber type. It carries the usual armament, crew and other equipment. Its useful load is 2,200 lbs. (1,000 kgs.) including petrol up to 150 galls. (680 litres).

FAIREY AIRSCREWS AND THE SCHNEIDER TROPHY RACE.

Since the introduction by Mr. S. A. Reed of his distinctive type of metal airscrew, every really important speed race including all those for the Schneider Trophy since 1923 has been won by a machine fitted with an airscrew of this type.

The Supermarine S.5 which won the Schneider Trophy in 1927, was fitted with an airscrew designed and built by the Fairey Aviation Co. Ltd., under the Reed licence, and an account of some of the problems which had to be solved before the successful airscrew was evolved has recently been issued by that firm.

The special advantage of the Fairey type of airscrew lies in the thin blade section which can be used. Such sections have proved that their aerodynamic efficiency does not fall off—as does that of thicker sections—at very high wind speeds. Airscrews for very high speed machines in practice must also be airscrews having high tip speeds, and thus the thin-blade airscrew scores heavily for such machines.

The problem of designing an airscrew for the machine which won the last Schneider race presented many very serious problems. The speed expected—and actually attained—was far in advance of any within the range of previous experience. The engine horse-power to be transmitted was very much larger than had previously been dealt with in any screw designed for ultra-high speeds, and the difficulties were if anything enhanced by the decision to use a geared engine in the race.

These difficulties were exaggerated by the lack of time for experiment, which made it impossible to proceed by the methods of trial and error. The method adopted was to design four different types of airscrew for each of the engines (geared and ungeared), and to select the best of each set by trial on the machines.

The first airscrew of each series was designed to give the maximum possible efficiency as a screw without any regard to the effects of interference caused by the aeroplane, or the effect of the slip-stream on the resistance of the machine. Existing aerodynamic theory gives a perfectly definite solution to the problem of designing such a screw, but such an "ideal" airscrew is certainly not the very best for use on the machine itself. Therefore the three other airscrews of each series were designed by varying the characteristics of the original "ideal" screw step by step in directions which were thought likely to reduce the practical deficiencies of that original.

For instance one type had its diameter increased to an extent which would reduce the airscrew efficiency, but which would tend to decrease the slip-stream velocity, and therefore the resistance of the part of the machine in the slip-stream.

In another the blade widths were distributed in a form which would not give the most efficient distribution of thrust, but which would reduce the probable boss interference.

Thus each set of screws formed a "family" in which the relative success or failure of each individual could with fair certainty be traced to one definite characteristic, thus giving the designer very valuable data for future use.

Aerodynamic performance in this case was obviously of the first importance, but actually the question of strength and stability caused more anxiety on the designer's part. Photographs which are here reproduced show that some of the airscrews in question were of very unusual proportions.

The actual normal working stresses however presented no difficulties, but the possibility of blade flutter and particularly that of hunting of the airscrew and shaft in resonance with either engine or aircraft components had to be considered.

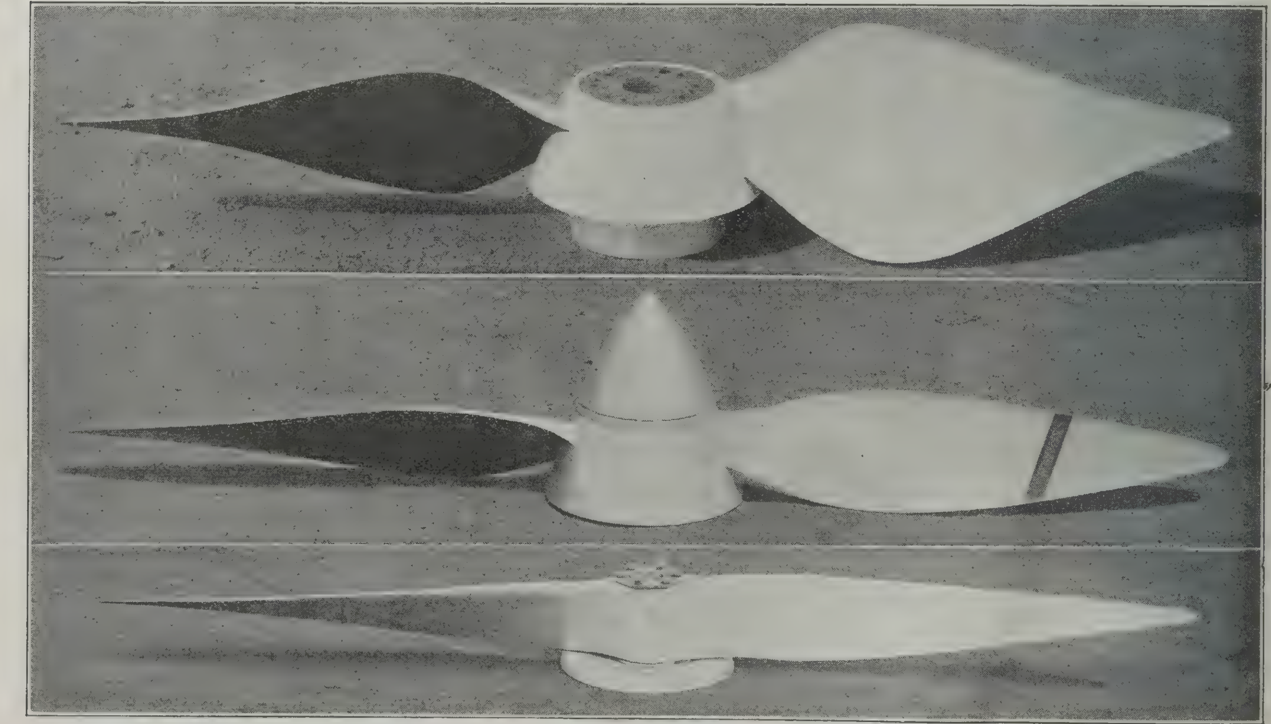
Actually blade flutter was completely avoided thanks to the experimental data available from past experience. Resonance trouble was found in one case, and though it was found possible to mitigate the trouble the particular type of airscrew had to be discarded owing to lack of time for further test

Comparative tests of the different types of airscrew were made according to an ordered scheme. Time did not permit of carrying out the whole schedule of tests, but by the time the machines left for Italy the choice lay definitely between two types for each of the engines, geared and ungeared. The final choice had to be left pending a decision as to maximum power and r.p.m. which could be permitted from the engines.

The airscrew chosen for the machine with a geared engine which won the race proved to be the original "ideal" form. The "ideal" screw for the direct-drive engine was that discarded because of resonance troubles, and the nearest to the "ideal" of the remaining three types was used instead. This fact is decidedly interesting, and tends to show that interference effects on airscrew performance tend to become negligible when the aircraft is of very low resistance.

A characteristic of Fairey metal airscrews is the fact that the blades are stabilised by centrifugal force, and consequently the bending moment caused by thrust loads does not fix the section of any part of the blade. From this it follows that design of such screws for strength and stability of running is simpler for airscrews running at high than at low r.p.m. Consequently these airscrews are in that respect better suited for use with direct drive engines than with those of geared type.

So far as at present known the Fairey Aviation Co. Ltd. are the only makers of the solid metal-blade type of airscrew who have successfully produced such screws for engines with reduction gears. That they should have done this and have attained a greater freedom from blade flutter than is found in similar screws of other makes running at much higher speeds is a very great tribute to their Technical Staff, of whom Mr. A. P. Ralli may fitly be mentioned as the person mainly responsible.



FAIREY METAL AIRSCREWS.—Three stages in the development of the Fairey-Reed racing airscrew. The middle picture shows the actual type used on the Supermarine S.5 monoplane.

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THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Flying Return for December, 1927.

Dual Instruction, 14 hr. 35 min. Solo Flying, 18 hr. 5 min. Passenger Flights, 1 hr. 35 min. Test Flights, 3 hr. 30 min. Total, 37 hr. 45 min.

Notes.—There has been no flying since Dec. 18. The Club was closed down for one week at Christmas and both before and after Christmas the weather prevented any flying.

The Annual Dance was held at Brent Bridge Hotel, Hendon, on Dec. 19. In spite of the inclement weather there was a fairly large gathering of members and friends.

The various Challenge Trophies won by the Club during the year were on view, and these included:—

The Air League Challenge Cup.—Won by Norman H. Jones. Second, W. T. Hay. Third, The Hon. Lady M. Bailey.

The Wakefield Trophy (Hamble).—Won by L. J. C. Mitchell.

The Wakefield Trophy (Liverpool).—Won by W. T. Hay.

The Newcastle Challenge Trophy.—Won by F. G. M. Sparks.

During the evening replicas of the Trophies were presented to the winners.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Dec. 25, 1927.

Flying Time 10 hr. 20 min. *Instruction.—With Mr. Parkinson*—Messrs. Thirlwell, Fairless, Miss Rambaut, De Pledge, V. Heaton. *Solo.*—Mr. De Pledge. *"A" Pilots.*—Miss Leathart, Mrs. Heslop, Mr. W. B. Ellis, Mr. C. Thompson, Mr. D. Wilson, Mr. Leech. *Passengers.—With Mrs. Heslop*—Mr. C. Thompson. *With Mr. C. Thompson*—Mrs. Heslop, Mr. A. Bell. *With Mr. Baxter Ellis*—Mr. P. Cooper.

Notes.—Mr. C. Thompson completed his 20 hours' flying since Aug. 1, on Sunday, the 25th. He is the first member of the Club holding Licence "A" to earn the full subsidy.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Dec. 24, 1927.

Flying Time 4 hr. 20 min. *Instruction* 2 hr. 20 min. *Solo* 1 hr. 45 min. *Test Flights* 15 min. The following members had instruction:—Mrs. Ranald, Mr. Kerry, Mr. Cripps, Mr. Storey and Mr. Lowe Wylde. The licensed soloists were Flg. Off. Southey, Mr. Parker, Mr. Falconer and Mr. Bowen, and the unlicensed soloists were Capt. Kirby and Mr. Cripps.

Most of our members forsook the rudder bar in favour of skates this week and also several consignments of assorted weather arrived, so our flying times were small.

Report for week ending Dec. 31, 1927.

The Club opened again on Friday after the Christmas holidays, but owing to lack of foresight or imagination on the part of those responsible for attending to such things, we have no ski undercarriages for our aircraft, so our instructor said, "Sno use."

However, a very jolly revel was held on New Year's Eve. It began as a dance in the Club-house, but after dancing for an hour or two someone suggested musical chairs and that started it.

All the usual seasonable games were indulged in, including "Dumb Crambo," when one team gave a delightful representation of a parachute drop, and the fun was kept up until 2 a.m. in the New Year.

We have had a machine standing by ready to go off and drop food to inhabitants isolated by the snow, but conditions have not rendered this action necessary.

The Norfolk and Norwich Aero Club.

[Sec.: H. O. Bennett, 5, Opie Street, Norwich.]

Report for week ending Jan. 1, 1928.

Flying Time 6 hr. 15 min. *Instruction.—With Mr. Lincs*—Messrs. A. G. Barrett, H. Birchall, R. F. Potter, H. Mack. *Soloists.*—W. A. Ramsey, W. P. Cubitt, H. Birchall, F. Gough. *Passengers.*—N. Paul, J. Morse, H. Hanworth.

Notes.—For the last 10 days our ground has been covered with four inches of snow, but despite this fact flying has taken place practically each day and one member, Mr. H. Birchall, has qualified for an "A" Licence, this being accomplished in an excellent manner under anything but ideal conditions; one, however, must remark upon his fine display of landings, such as stalling landings, three-pointers (but not the perfect points), and pancakes, etc.

At one moment it looked certain that he was determined to repeat his previous effort, but a molehill upset these calculations, so now we have a Moth still intact.

This is our seventh "A" Licence holder; two others are expected during January.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Jan. 1, 1928.

Flying Time 4 hr. *Instruction.—With Mr. Lowdell*—Miss Edwards, Mr. Billinton, F. H. Jolly, F. Verney. *Passengers.—With Mr. Lowdell*—Miss Eastern, Mr. Watt. *With Mr. Prentice*—Miss Rygate, Miss Eastern, Mr. Billinton. *Soloists.*—Dr. Jas. Sleigh.

Notes.—Sir Sefton Brancker visited the Club on Tuesday, Dec. 20. He arrived from Martlesham in an Avro Lynx piloted by Sq. Ldr. Noakes. Sir Sefton Brancker inspected the Aerodrome and Club-House and expressed his satisfaction of the work the Club has done.

Although there had been a heavy fall of snow and a bitterly cold wind was blowing our President, The Hon. Lady Bailey, flew over to welcome Sir Sefton.

The Committee and members of the Suffolk Club very much regret to hear of Mr. C. G. Grey's accident and sincerely hope he will have a speedy recovery.

The Club wishes to remind C. G. G. about the wheel-back chairs to which he kindly gave so much publicity, and wish to assure him that these are now at his disposal.

The Bristol and Wessex Aeroplane Club.

[Sec.: Col. G. Flemming, O.B.E., M.C., Filton Aerodrome, Bristol.]

Report for fortnight ending Dec. 31, 1927.

Flying Time 12 hr. *Instruction* 2 hr. 45 min. *Soloists* 4 hr. 40 min. *Passengers* 4 hr. 35 min. *Instruction.—With Mr. E. B. W. Bartlett*—Miss H. Pitman, Messrs. H. A. Tiarks, E. T. Garnett, A. E. Stephens, P. H. Bryan, A. E. Arnold, and Dr. F. J. Farr. *Soloists under Instruction.*—Mr. A. E. Roberts. *"A" Pilots.*—Messrs. A. H. Downes-Shaw, J. E. Tratman, R. A. Hall and C. E. Pitman. *Passengers.—With Mr. Bartlett*—Hon. Miss U. Bathurst, Mrs. Bowles, Mrs. Maurice and Mr. Morris. *With Mr. Tratman*—Mr. Kilsby. *With Mr. C. E. Pitman*—Miss H. Pitman, Mr. J. Pitman, Mr. P. Pitman, Mr. T. H. Clarke.

Notes.—The Club considers that it has established a record. Mr. C. E. Pitman left Filton for Eton and returned with his younger brother, Mr. P. Pitman, in under three hours. This is the first time that a member of a Public School has proceeded on his holidays by aeroplane.

TOWARDS AUSTRALIA.

On Jan. 2 Mr. W. N. Lancaster and Mrs. Keith Miller, who are attempting to fly to Australia on the Avro Avian "Red Rose," left Rangoon for Tavoy.

COLONEL LINDBERGH'S TOUR.

At dawn on Dec. 28 Col. Lindbergh left Mexico City on the Ryan monoplane "Spirit of St. Louis" for Guatemala City. He landed at Guatemala City at 12.58 hours (Mexico City time) after a 675-mile flight over mountain and jungle.

On Dec. 30 he left Guatemala City at daybreak and alighted at Belize, British Honduras, at 09.45 hours, after a 250-mile flight over mountains and trackless forest. At first it had been decided not to land in British Honduras owing to lack of landing facilities, but after circling the improvised landing field Col. Lindbergh found it practicable to land. He was met by the Governor, Sir John Alder Burton, most of the officials of British Honduras, and a large crowd, who gave him a very hearty welcome.

On Jan. 1 at 06.20 hours he left Belize and at 09.10 hours landed at San Salvador, covering the distance, which normally takes three days by launch and railway, in less than three hours.

The later stages of his journey will take him to Honduras, Nicaragua, Costa Rica, Panama, Colombia, Venezuela and the Antilles, with possibly a stop at Trinidad.

LA PAZ—LIMA.

On Dec. 29 M. Costes and Lieut. Le Brix, who are touring South America on the Breguet XIX (500 h.p. Hispano-Suiza engine) on which they flew from Paris across the South Atlantic, flew from La Paz, Bolivia, to Lima, Peru.

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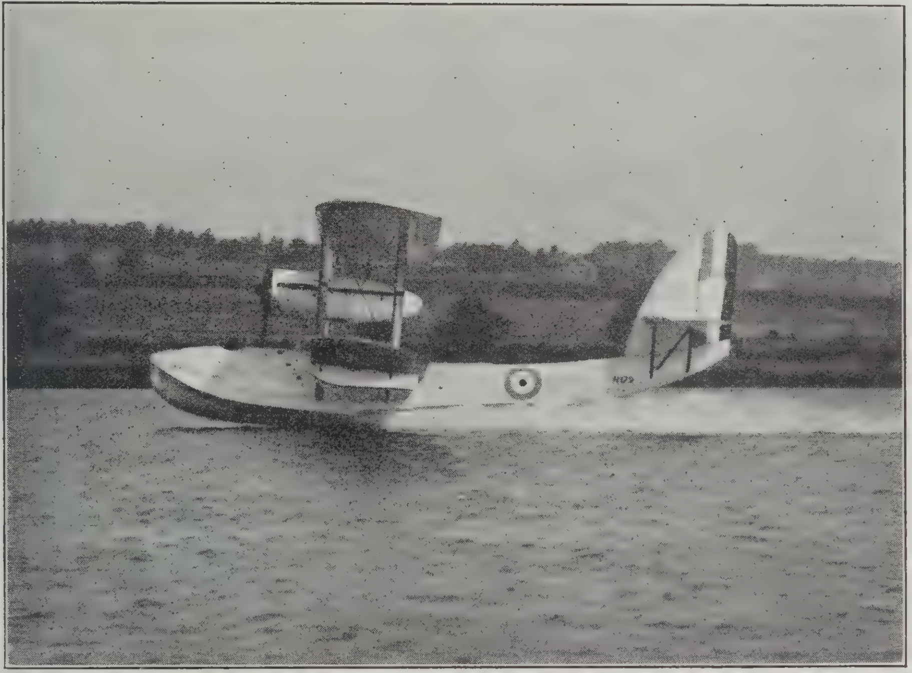

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SIR ALAN COBHAM AT MALTA.

According to a letter just received from Sir Alan Cobham at Malta, there is every likelihood that the Short Singapore will be ready to leave Malta during the first week of this year.

The damage sustained by the machine seems to have been even more extensive than was reported at the time. The first wing-tip float carried away after the machine had alighted at Calafrana while the machine was in tow. The machine then had to be moored out in a very heavy sea, with the opposite wing-tip ballasted to keep its float on the water. At the end of this period the second wing-tip float was wrenched off.

It was then necessary to drag the machine up the slipway resting on her hull. This done, a new gale sprang up and the waves began to break over the tail, and it was necessary to drag her still higher up the slipway. While this was being done one lower wing was wrecked.

After getting the machine chocked up—there being no shed big enough to take her—she was blown over and some damage was done to the other wing.

A new lower wing was delivered at Malta on Dec. 26, a remarkable piece of work by Short Bros. During transport a heavy weight had been dropped on its packing case, had broken the lid in, and smashed several ribs. A store of paint and varnish which was sent out at about the same time also arrived with the tins burst open.

Despite these misfortunes rapid progress has been made with repairs and reports of a departure from Malta may be expected at any moment now.

Sir Alan Cobham has made use of his spare time in the interval lecturing and otherwise propagandising the inhabitants of Malta and hopes to have persuaded the Maltese Government of the desirability of providing the island with a civil air port.

A JUPITER HEIGHT RECORD.

On Dec. 21 Commendator Donati, on a single-seat fighter of Dewoitine design, built under licence by the Ansalde firm, and fitted with a Jupiter Series IV. high compression engine built by Nicola Romeo and Co., the Italian licensees for the Bristol Jupiter engine, reached a height of 11,827 metres (38,800 ft.).

This figure is said to have been corrected, and to have been accepted officially as an Italian record. It is 100 metres more than the standing World's record held by Lieut. Champion, U.S.N., and will be submitted to the F.A.I. for homologation as a World's record

The Jupiter engine, running on a specially light aviation spirit and castor-oil, ran perfectly throughout the flight, despite the fact that a temperature of —60°C. (—76°F.) was found at the greatest altitude.

The machine reached 3,000 m. (9,840 ft.) in four minutes, 5,000 m. (16,400 ft.) in nine minutes, and the maximum height was attained in 42 minutes.

PARIS—HANOI.

Col. Antoinat and his three companions who are attempting to fly from Paris to Hanoi on a Lioré-et-Olivier biplane (two Gnôme-Rhône Jupiter engines) have had an unpleasant experience in the hands of the Turks.

On their arrival at Adalia from Rome on Dec. 20 they were arrested under the pretext that they had flown over Smyrna, but they were released after vigorous protests. In order to avoid further unpleasantness they left Adalia in spite of a strong gale, but were forced to land at Mersina, where they were surrounded by a crowd of hostile armed peasants, who attempted to burn the machine and its occupants.

With utmost difficulty they managed to pacify the peasants, and suffering from hunger and thirst, and in spite of the damage to their machine, they took off for Alexandretta on Christmas Day. After refuelling they continued to Rajak, where the machine is now being repaired.

EDOUARD DE LAMOTHE.

On Dec. 20, Edouard de Lamothe, chief pilot of the Etablissements Lioré et Olivier, was killed at Villacoublay in extremely unfortunate circumstances.

He was making the official speed tests of a new experimental type when, in approaching the speed base low down, he struck an electric cable. The machine immediately caught fire and de Lamothe was burned to death. The mechanic, although badly burnt, survived the accident.

De Lamothe learned to fly in 1915 and served in fighting squadrons in the French Air Arm during the war. Since the war he specialised in test flying and at the time of his death was the *doyen* of test pilots at Villacoublay. The fact that one so experienced should meet his death in this manner suggests that he had sudden engine trouble which, at an altitude of 25 feet, left him no choice as to a suitable landing place. In any case it seems that the presence of electric cables in the immediate vicinity of the principal official French test station shows a remarkable lack of foresight on the part of the authorities.

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This machine is the standard aircraft used in two of the most important flying schools in Great Britain, where its high flying qualities and its very real economy are appreciated.

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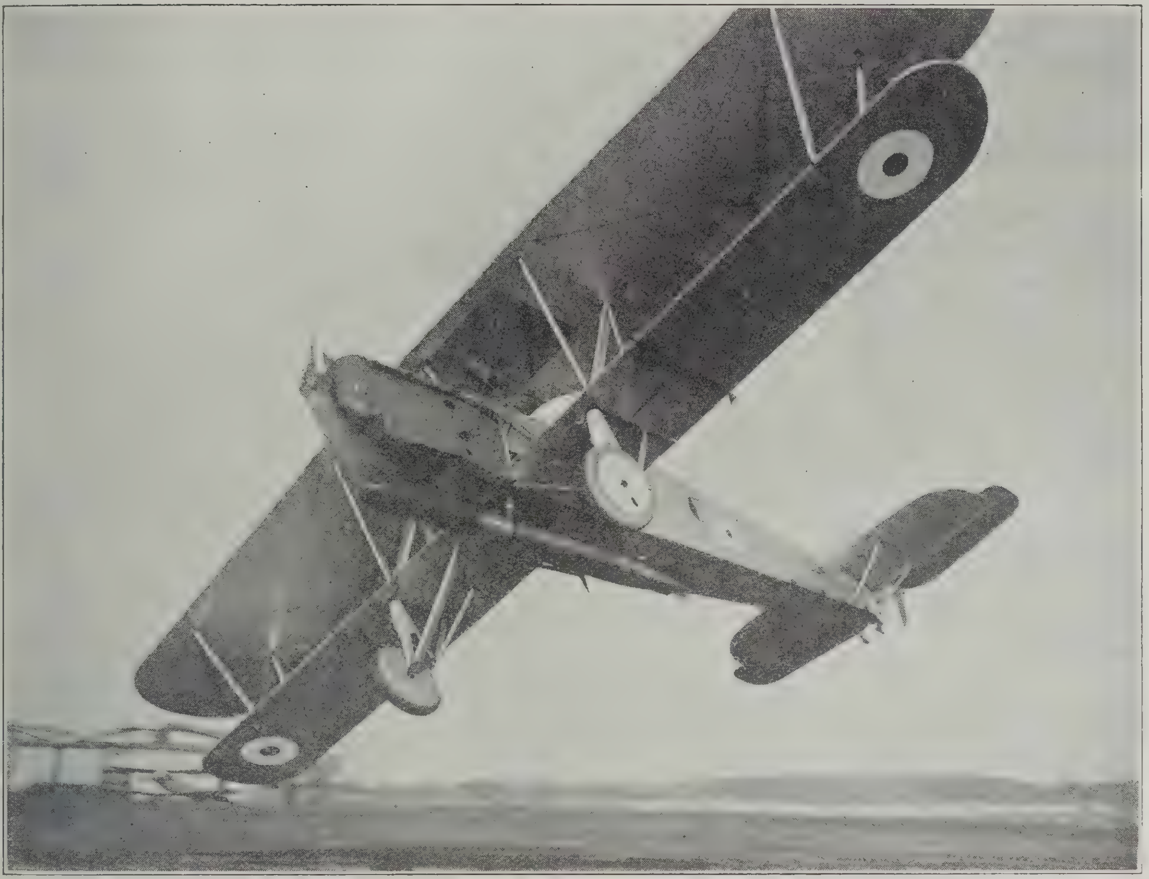

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"The Hawker 'Horsley' Torpedo Bomber as illustrated is now in production. The machine meets in every respect the exacting requirements of torpedo carrying aircraft and can be considerably overloaded without impairing its efficiency."

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE WEEK ENDING DEC. 25.

Trips per Day.—Monday, 15; Tuesday, 14; Wednesday, 2; Thursday, 8; Friday, 7; Saturday, 11; Sunday, 0.

Imperial Airways Ltd. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 27, passengers 139, freight 11 tons.

Air Union :
Paris—London : Machines 10, passengers 29, freight 14 tons.

K.L.M. :
Amsterdam—Rotterdam—London : Machines 9, passengers 28, freight 4 tons.

Sabena :
Brussels—London : Machines 7, passengers 4.

Deutsche Lufthansa AG. :
Amsterdam—London : Machines 4, passengers 2.

Private :
Machines 0, passengers 0.

Total number of trips by British Machines, 27, carrying 139 passengers. Foreign Machines, 30, carrying 63 passengers.

COMPARATIVE FIGURES.

Week ending Dec. 25 :
Machines, 57; Passengers, 202; Crews, 101; Total personnel, 303.
Corresponding week, 1926 :
Machines, 65; Passengers, 145; Crews, 80; Total personnel, 225.
Corresponding week, 1925 :
Machines, 23; Passengers, 76; Crews, 27; Total personnel, 103.
Corresponding week, 1924 :
Machines, 45; Passengers, 103; Crews, 56; Total personnel, 159.
Corresponding week, 1923 :
Machines, 11; Passengers, 17; Crews, 16; Total personnel, 33.
Corresponding week, 1922 :
Machines, 41; Passengers, 95; Crews, 81; Total personnel, 176.
Corresponding week, 1921 :
Machines, 30; Passengers, 49; Crews, 48; Total personnel, 97.
Corresponding week, 1920 :
Machines, 8; Passengers, 10; Crews, 10; Total personnel, 20.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 0; Tuesday, 0; Wednesday, 4; Thursday, 9; Friday, 16; Saturday, 17; Sunday, 0.

Imperial Airways Ltd. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 17, passengers 136, freight 7 tons.

Air Union :
Paris—London : Machines 12, passengers 27, freight 9 tons.

K.L.M. :
Amsterdam—Rotterdam—London : Machines 7, passengers 15, freight 1½ tons.

Sabena :
Brussels—London : Machines 5, passengers 8.

Deutsche Lufthansa AG. :
Amsterdam—London : Machines 5, passengers 4.

Private :
Machines 0, passengers 0.

Total number of trips by British Machines, 17, carrying 136 passengers. Foreign Machines, 29, carrying 54 passengers.

COMPARATIVE FIGURES.

Week ending Jan 1 :
Machines, 46; Passengers 190; Crews, 83; Total personnel, 273.
Corresponding week, 1927 :
Machines, 43; Passengers, 93; Crews, 78; Total personnel, 171
Corresponding week, 1926 :
Machines, 28; Passengers, 39; Crews, 31; Total personnel, 70
Corresponding week, 1925 :
Machines, 22; Passengers, 49; Crews, 25; Total personnel, 74
Corresponding week, 1924 :
Machines, 35; Passengers, 58; Crews, 57; Total personnel, 115.
Corresponding week, 1923 :
Machines, 41; Passengers, 109; Crews, 80; Total personnel, 189.
Corresponding week, 1922 :
Machines, 15; Passengers 36; Crews, 23; Total personnel, 59
Corresponding week, 1921 :
Machines, 21; Passengers, 15; Crews, 25; Total personnel, 40

Croydon Notes.

Croydon aerodrome lies just inside one of the areas most heavily afflicted by the Christmas snow-storm, and a heavy layer of snow—about two feet deep on Monday morning—interfered very seriously with flying.

The first machine to use the aerodrome after the snowfall was Flt. Lt. Soden's private Moth, which landed there on Tuesday. Flt. Lt. Soden was on his way to Switzerland for Winter Sports and had his skis strapped to the fuselage of his machine. Hence the paragraph in some London papers concerning a light aeroplane fitted with skis which landed at Croydon on this day

On Wednesday three Imperial machines arrived at Croydon —one from Cologne and the other two from Paris. A good deal of doubt was felt as to whether it was safe to land in the snow, and the machines were actually ordered to land at Stag Lane instead, but this order was countermanded, and all three alighted safely at Croydon. The strong N.E. wind had been steadily drifting the snow up into the S.W. corner of the aerodrome, and a great part of the surface was by now relatively thinly covered with hard snow.

Only on Thursday was it thought safe to attempt to take machines off from the snow. When the attempt was made no difficulty was found, in fact there is little doubt that normal services could have been started on Wednesday.

The interruption of the Cross-Channel boat services by the gale created a brisk demand for passenger transport to the Continent by air, consequently all services were duplicated, and all machines filled to their utmost capacity on this day.

Unfortunately by the following day steamers were running once more, and the passenger traffic—though still above normal—only called for a doubled Silver Wing service to Paris. Had the services started on Wednesday, every available machine could probably have been filled.

The most serious trouble caused by the snow was the blocking of the level crossing across Plough Lane by a drift three to four feet deep. This made it impossible for cars to reach the aerodrome buildings, or for machines in the sheds west of Plough Lane to be brought onto the aerodrome. With the strong N.E. wind which persisted for the first half of the week, fresh snow from the aerodrome was steadily blown into the crossing as fast as the old snow was shovelled away, and right up to the end of the week there was snow four feet thick across the lane.

A passage-way wide enough for aeroplanes was opened at the north edge of the crossing by Wednesday, but cars had to leave the road and pass round the sheds on the west of the lane to reach the aerodrome right up to the end of the week.

THE FIRST INTERRUPTION ON THE MIDDLE-EAST ROUTE.

The first interruption on the Middle-East service of Imperial Airways since its opening a year ago occurred on Thursday, Dec. 29.

On that day a wireless message was received from the D.H.66 *City of Cairo,* piloted by Mr. Dudley Travers, stating that he had met abnormally strong head-winds across the desert and had been forced to land by shortage of petrol between landing grounds 4 and 5, about 200 miles west of Baghdad, and asking that a car with petrol should be sent to him. The car was duly sent, but failed to find the machine, and a search by air showed that the machine was not on the normal route.

The *City of Cairo* was not found until the morning of Dec. 31, when Capt. Warner, on a second D.H.66, spotted it some 50 miles south of the expected position.

It was then surrounded by Arabs, who had treated the passengers and crew with the utmost courtesy, and had done all in their power to make them comfortable.

The four passengers—among them Capt. Warner's wife—and the mails were transferred to the second machine and reached Baghdad safely during the course of the day. Petrol was taken to the *City of Cairo* by air, and that machine also reached Baghdad during the day.

Although the emergency wireless gear on the *City of Cairo* was apparently in good order, and was used continuously, no message from the stranded machine after the first announcement of landing seems to have been received. This is said to have been due to jamming caused by constant use of wireless by machines searching the desert for the missing aeroplane.

FEEDING THE SNOWBOUND.

The isolation by snowdrifts of villages and lonely houses in the neighbourhood of Biggin Hill gave occasion for displaying the usefulness of aircraft as supply transports. On Thursday, Dec. 29, Mr. W. L. Hope and Mr. G. Birkett of Air Taxis Ltd. flew from Stag Lane to the Biggin Hill District on a D.H.50 and a Moth carrying parcels of bread, butter, tea, and similar supplies and dropped these parcels by parachute near snowbound villages and houses.

This process was repeated on Saturday, Dec. 31, when some hundreds of parcels each containing a tin of biscuits, half

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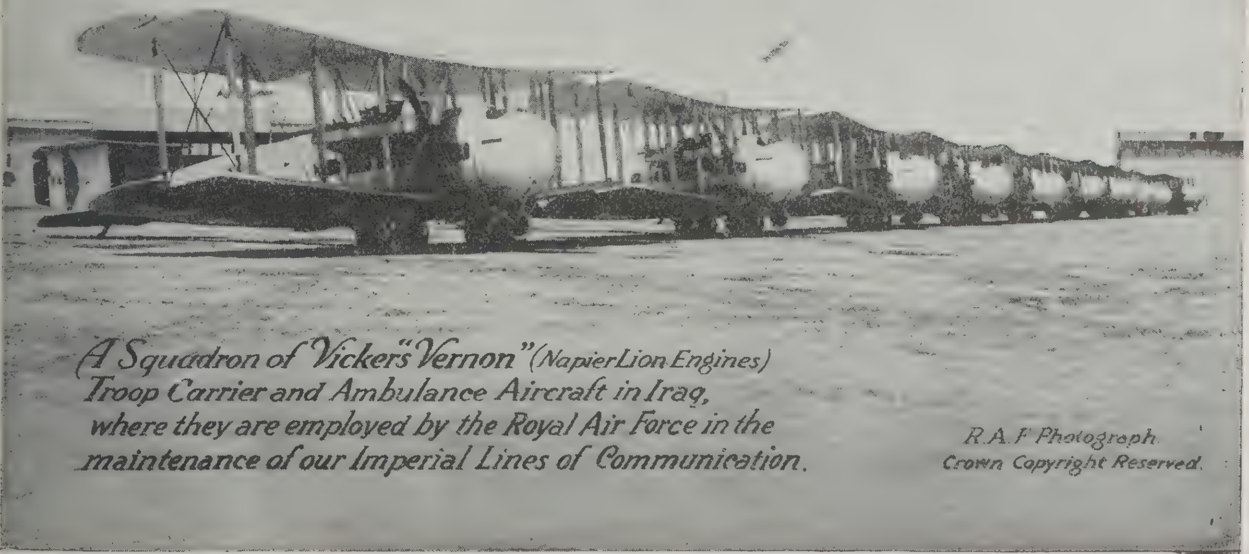

A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph.
Crown Copyright Reserved.

a pound of cocoa, a dozen cubes of beef extract, three tins of condensed milk, a tin of corned beef, a tin of salmon, and a copy of *The Times,* were dropped in the neighbourhood of Addington, Lingfield, Redhill and Sevenoaks.

So far as can be discovered none of the inhabitants of these districts was actually in serious straits for food, but had their snow-bound condition continued for a few days longer some undoubtedly would have suffered very severely, and this demonstration has at least served to show how aircraft could be employed under these conditions.

Had the wintry weather continued, the Salvation Army were making arrangements for a similar distribution of food on a large scale, not only in Kent, but in other districts.

AN EXAGGERATED INCIDENT.

Mr. Birkett, of Air Taxis Ltd., returning from Le Bourget on a Moth with a passenger on Friday afternoon, Dec. 30, ran into darkness approaching the French coast and decided to land for the night at Fort Nieulay. In so doing he ran into a snowdrift and slightly damaged his airscrew and undercarriage.

Hence reports that a British aeroplane on the Croydon—Le Bourget route had fallen into a quarry.

FRENCH AIR LINES TO THE EAST.

Arrangements for the expenditure of the large sum allocated in this year's French Budget for the subsidization of an air service to the East are making rapid progress.

According to reports from Paris, the Compagnie Internationale de Navigation Aérienne (C.I.D.N.A.) intend during the coming season to extend the existing service to Constantinople on to Cairo, presumably overland via Syria.

At the same time a new company, in which Air Union and the Suez Canal Co. are reported to be interested, are said to be arranging for a seaplane service from Marseilles to Alexandretta, on the coast of Syria, and thence overland to Iraq to join Imperial Airways Middle-East Services.

The same company proposes a further service to Cairo from Marseilles, and has in view an extension of its services overland to China.

Discussions between representatives of the French interests concerned and the British Air Ministry concerning facilities for this service in the British sphere of interest are said to be in progress, and it is further stated that an agreement bearing on the use by the French line of Italian ports of call has already been initialled by Gen. Balbo, the Italian Under-Secretary of State for Air.

The new services—if and when they are working—will provide air communication between Britain and Basra—or perhaps by then Karachi—of which only the London-Paris and the Baghdad-Basra section are under British control.

SPANISH CIVIL AVIATION.

The Spanish Air Council has recommended the unification and concession to a single company of the commercial air services all over Spain. The capital, staff and equipment of this company would have to be Spanish, and the company would receive a Government subsidy.

At present there are four air lines operating in or through Spain, two of which, the Compañia Española de Trafico Aereo and the Union Aerea Española, are subsidised by the Spanish Government. Of the remaining two, the French Latécoère line from Toulouse to Rabat and Casablanca follows the east coast of Spain and uses the aerodromes at Barcelona and Alicante and an extension of the Deutsche Lufthansa, known as La Iberia, operates from Barcelona to Madrid.

CIVIL AVIATION IN YUGO-SLAVIA.

The Yugoslav Skupshtina has passed an Air Traffic Bill for the regulation of civil aviation in Yugoslavia. This Bill was submitted by the Minister of War, who laid emphasis on the importance of rapid communication between remote parts of the country which otherwise would be difficult of access. He also said that in the event of national emergency civil aviation could easily be transformed into a branch of the military service.

A new civil air line to begin on Feb. 15 will use Potez aircraft similar to those in use by the Army Air Service.

AN AVRO ACQUISITION.

Mr. H. A. Brown, who succeeded Mr. Neville Stack as instructor and aerodrome manager to the Lancashire Aero Club, has been appointed test pilot to A. V. Roe and Co. Ltd. Mr. Hinkler, who since 1920 had been the firm's chief pilot, gave up this appointment early in 1927. Mr. Dudley Watt did some test work for the firm during 1927, and Mr. Hinkler, as a "free lance," has recently done further work.

Mr. Hinkler is starting off in a few days on his long-delayed flight in an Avian to Australia, and so Mr. Brown has now been appointed permanent test pilot. If he is as good as a test pilot as he is an instructor the test work for A. V. Roe and Co. Ltd. will be in good hands.—G. D.

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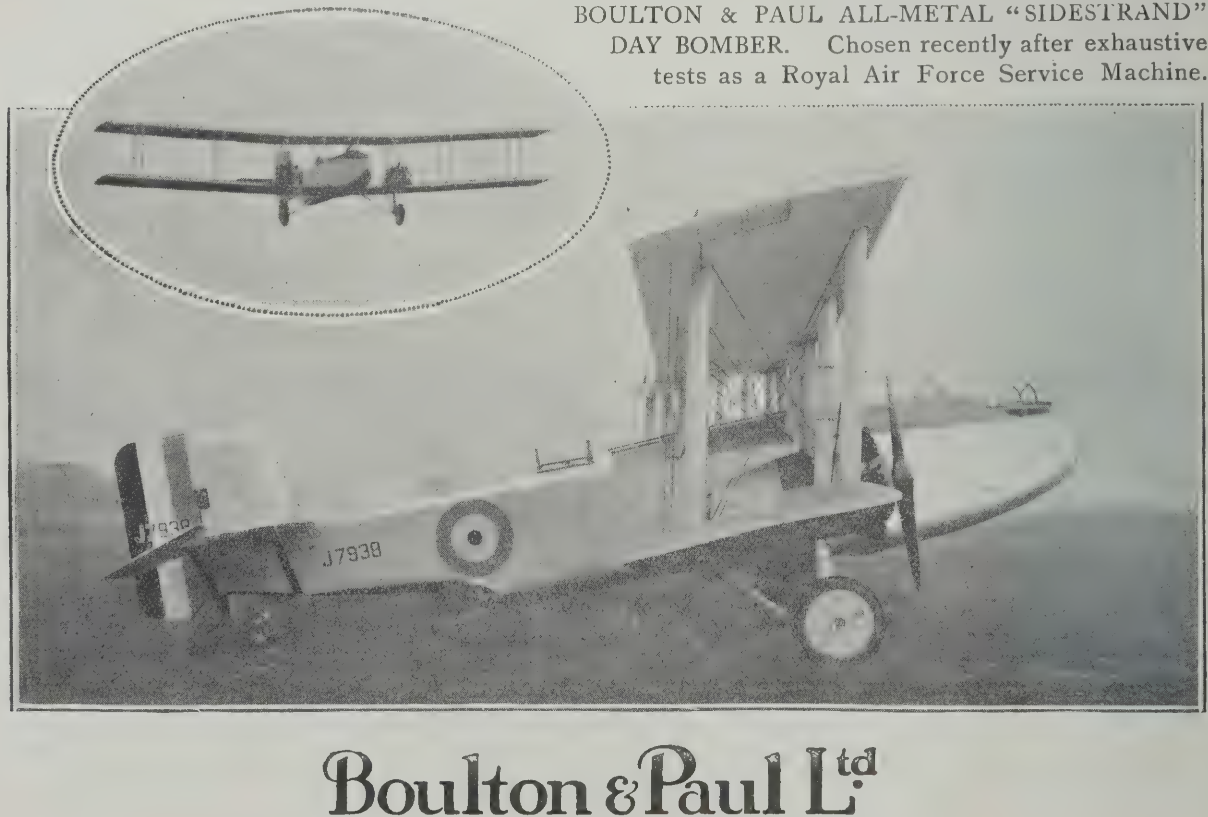

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A FUTILE ATTEMPT.

On Dec. 24 a Sikorsky amphibian, piloted by Mr. Oskar Omdal and carrying Mrs. Grayson as passenger, Mr. Brice Goldsborough as navigator, and Mr. Koehler as mechanic, left Roosevelt Field, N.Y., for Harbour Grace, Newfoundland. It was the intention of Mrs. Grayson to leave Newfoundland on Christmas Day in an attempt to fly across the Atlantic.

With the exception of one or two undecipherable wireless signals picked up along the coast of Nova Scotia and New foundland, nothing has since been seen or heard of the machine.

RECEIVERSHIP.

British Anzani Engine Company Ltd.—H. Button, of 61/2, Lincoln's Inn Fields, W.C.2, ceased to act as Receiver and Manager on Dec. 20, 1927.

PERSONAL NOTICES.

Death.

WILLIAMSON.—On Dec. 18, at Heaton Moor, Cheshire, Ian, the only son of Flt. Lt. and Mrs. J. J. Williamson, age 4 years and 8 months.

Forthcoming Marriages.

DAVIS—VAN DER GOES.—A marriage has been arranged, and will take place in London in February, between Flt. Lt. E. P. M. Davis, A.F.C., A.M., and Frederika (Freda), daughter of his Excellency Jonkheer A. van der Goes, Netherland Minister in Rome, and Mme. van der Goes.

GROVES—HUMPHERY.—The engagement is announced between Flt. Lt. J. Osborn Groves, eldest son of Col. and Mrs. Groves, of Dean's Green Hall, Lymm, Cheshire, and Elizabeth Mary, younger daughter of the late Mr. and Mrs. H. C. Humphery, of Beaulieu, Hants.

Marriages.

CRITCHLEY—FOSTER.—On Dec. 22, at a registrar's office, London, Brig.-Gen. A. C. Critchley, C.M.G., D.S.O., to Miss Joan Foster.

ROBB—JOHNSTON.—On Dec. 29, at Beaulieu Abbey, Sq. Ldr. James Milne Robb, D.S.O., D.F.C., to Bessie Murray, youngest daughter of the late J. T. Johnston and Mrs. Johnston, Pulborough.

Births.

ELLEN.—On Dec. 23, at St. Clements, Grantham, to Gladys (*née* Gardner), wife of Flt. Lt. C. N. Ellen—a daughter.

FODEN.—On Dec. 22, at Hill House, Christchurch Road, Winchester, to Rosalind, wife of Flt. Lt. J. C. Foden, A.F.C., R.A.F.—a daughter.

LOWIS.—On Dec. 31, at 22, Blackburnes Mews, W.1, to Lallie Lee, wife of Lt.-Cdr. G. L. Lowis, A.F.C., R.N. (retd.)—a daughter.

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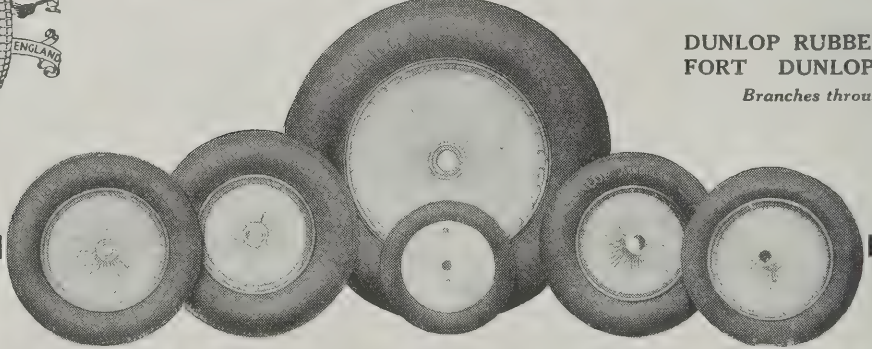

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ON THE FUTURE—II.

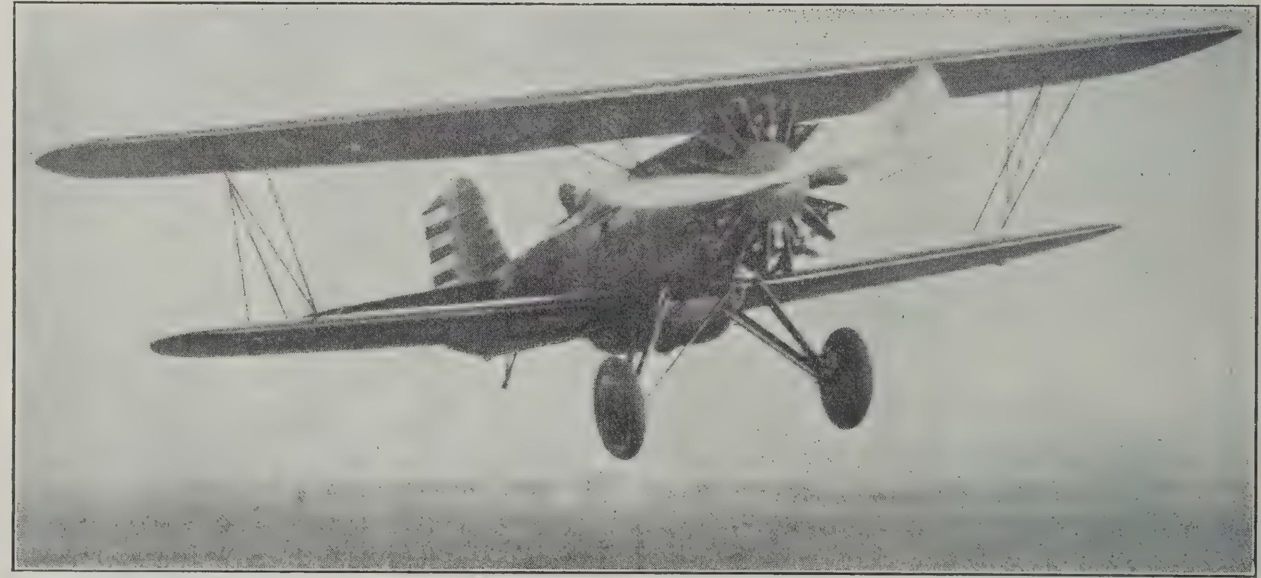
THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 2. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"THOU HAST HAWKS WILL SOAR ABOVE THE MORNING LARK."
(SHAKSPEARE—*Taming of the Shrew.*)



WELL AWAY:—A Curtiss Hawk (XP-3A) single-seat fighter (425 h.p. Pratt and Whitney Wasp engine) belonging to the U.S. Army Air Corps, taking off. This machine, which is an experimental one, is almost identical to the type F6C-4, numbers of which have been supplied to the U.S. Navy.

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THE AEROPLANE

Incorporating
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VOL. XXXIV. No. 2.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON THE FUTURE OF FLYING—SERVICE AND CIVIL.

[Being an Address delivered by C. G. Grey to the Cambridge University Aeronautical Society and the Cambridge University Air Squadron on Wednesday, Oct. 26, 1927.]

PART II.

WHY HIGH SPEED IS WORTH WHILE.

For the last five years the Americans have been running an air-mail line over the 3,000 miles from San Francisco to New York with something like 90 per cent. regularity, a machine leaving each terminal once a day. And taking it all round they have averaged just on a hundred miles an hour with old machines of war-time design.

So long ago as June, 1924, Lieut. R. L. Maughan, of the U.S. Army Air Service, on a practically standard type Army Pursuit Ship, a Curtiss P.W.8, flew the 2,670 miles from the Atlantic to the Pacific in 18 hours 26 minutes, which is as near as no matter 150 miles an hour. That flight was done with, one believes, five landings to refuel, each stretch covering about 500 miles.

Now the distance from London to Cape Town is about 8,000 miles, London to Delhi is about 6,000 miles, and London to Melbourne is about 13,000 miles.

So, given the 240 miles an hour machine, and given a proper international airway (such as ought to exist to-day if the League of Nations had the influence which its grandiloquent title implies), and given that it is adequately lighted for night flying, as the American trans-continental airway has been lighted for the last five years, and given proper relays of men and machines, exactly as the Americans have been doing all these years with their air-mail service, and we could run our mails from London to Cape Town in about 35 hours instead of 14 days; we could run them from London to the capital of India in about 25 hours, and we could run them from London to Melbourne in a little over 55 hours, instead of about a month.

That means that Cape Town and Delhi would be postally roughly as far away as Inverness, and Melbourne would be about as far away as Berlin.

Now those figures are not wild prophecies. They are perfectly simple practical propositions, which could operate within twelve months from now if the business men of the World could be awakened to the value of high speed mail-carrying. But why *should* they awaken to it? Let us see.

You can quite imagine that in the days when the specially high-speed mail coaches averaged about eight miles an hour from London to York and everybody was perfectly satisfied with carrying on a business correspondence on that basis, if anybody had talked about conveying letters by rail at even fifty miles an hour they would have been looked upon as crazy.

But an air-mail service from London to Cape Town in 35 hours is nothing like such a wild proposition as a 50-mile an hour mail service from London to York would have appeared when the Stockton and Darlington Railway was opened in 1826, just over a hundred years ago.

We have all heard quite a lot in the newspapers about the regrettable failure of an R.A.F. machine to fly non-stop from London to India during the past year. Of course, it would have been very nice for British prestige if we had been able to do that flight, and had shown that we could get to our Far Eastern Possessions without saying by-your-leave, or thank-you, to any foreign nation for the use of their landing-grounds.

But one does venture to suggest that it would be much more impressive if, with the permission and assistance of France and Italy, relays of our machines were to take a message from London to Delhi, even at our existing speeds, in about a day and a half.

SAFETY FOR AIR TRAVELLERS.

So much for high speeds of the future. Now let us have a look at the secondary consideration of safety. We must at any rate have reasonable safety before we can expect a vast number of passengers to travel by air as a habit.

We can at any rate claim that aero engines are as reliable as car engines. If you compare the number of starters and the number of finishers in, say, a 200-mile race at Brooklands, you find the proportion is very much the same as that in about a thousand-mile air race, such as that for the King's Cup.

For passenger work on regular air lines we have achieved reliability by using two, and now three, engines—though, as a matter of fact, the various air lines in Australia seem to have achieved equal reliability with single-engined machines by the simple process of running their engines well within their power and keeping them always in perfect running order.

With continual improvements we shall get greater and greater reliability. But what is wanted even more than the

AIR SURVEY IN THE EAST.—The staff of the eastern branch of the Air Survey Company with a D.H.9 seaplane (240 h.p. Puma engine) at Rangoon.

certainty of being able to stop in the air, is the certainty of being able to get down safely if one has to make forced landings.

Ever since flying began inventors of all sorts have been popping up with schemes for getting down safely when the engine stops. All sorts of things have been suggested.

Parachutes have been suggested to sustain the whole machine and its crew, regardless of the fact that the pilot and passengers would have to take their chance of what the wind blew them into when they were near the ground.

Helicopters, to allow the machine to alight vertically, have been invented on paper at the rate of dozens a year, and all have been useless.

We have only quite recently arrived at what seems to be the ultimate solution of the puzzle.

Slot Control.

Those of you who have been interested in aviation for any length of time have, of course, heard of the Handley Page Slot. It was originally intended to help machines to get off the ground with a shorter run and to alight at a steeper angle.

Then the invention was developed to give lateral control to the machine when in a stalled condition, so as to prevent it from rolling over sideways and spinning into a nose-dive, which is the ultimate cause of at least 80 per cent. of the fatal accidents which happen in aviation.

That form of control has, until quite recently, been hampered by the weight and complication of the mechanism necessary to work it. But now the Handley Page experimenters have arrived at the very simple solution of arranging the slot so that it opens and shuts itself.

This is just one of those simple and perfectly obvious things which make one want to retire into a corner and kick oneself for not having thought of it before.

It is the kind of thing that always happens with all the great inventions. Somebody gets hold of an idea which is quite simple in itself but there is some mechanical difficulty about making it work. Then all kinds of elaborate mechanism is introduced to make it work. And finally somebody comes along with a perfectly simple method which ought to have been obvious at the start.

Just the same thing happened with the pneumatic tyre. The original pneumatic tyre consisted of a rubber tube inside a canvas tube, to prevent it from bursting, held on to the rim by more canvas and rubber solution, and on top of the lot a rubber tread was stuck with rubber solution to take the road wear. To repair a puncture one had to unbuild the whole thing and then stick it back again with masses of rubber solution—which was half a day's job.

And then, five years after the pneumatic tyre had first been introduced, Charles Kingston Welch came along with the very simple method of using an endless-wire hoop in each edge of the tyre, which, when the tyre was deflated, could be dropped into a groove in the middle of the rim, leaving the other side of the hoop free to come out over the edge of the rim.

And, curiously enough, almost at the same time Bartlett thought of the "beaded edge" method of attachment, commonly known as the Clincher, which became universal on all motor tyres, until the balloon tyre came along and we went back to the wired-edge again.

The Welch and Bartlett patents were what made road transport of to-day possible. And one believes firmly that the Handley Page Automatic Slot will have even greater influence on air transport.

Why Accidents Happen.

One has said that at least 80 per cent. of the fatal accidents which happen in aviation are due to stalling, spinning and nose-diving. Pilots getting off with an over-loaded machine or pulling off too steeply stall their machines. Pilots trying to land too slowly stall their machines. Pilots trying to reach a safe bit of landing ground with a failing engine or a dead engine stall their machines. Pilots turning down wind to try and get back to a safe landing place stall their machines.

In every case the same thing happens.—The wings lose their lift and the machine begins to sink. Then one wing-tip drops, the pilot tries to pull it up by pulling the aileron down. He stalls that wing still worse, and puts a drag on it. The machine, in which none of the controls are operating, spins round to that side and goes down nose first. If there is enough room below it and if the pilot knows how to get out of a spin nothing happens. But the great majority of fatal accidents are caused by lack of room or lack of knowledge.

In the latest development of the Handley Page Slot the slots open when the plane is on the point of stalling. The force which opens them is merely the lifting force of the air over the slot-plate itself,—which is a little aeroplane on its own account. The curious thing is that until recently nobody thought of leaving the slot to open itself.

Still further to improve the control of the stalled machine all that is necessary, when the machine rolls over to one side, is to close the slot and lift the aileron on the uppermost wing. That kills the lift on that wing and drops it. The slot can be connected to the aileron by a very simple wire mechanism and is operated by the ordinary aileron cables.

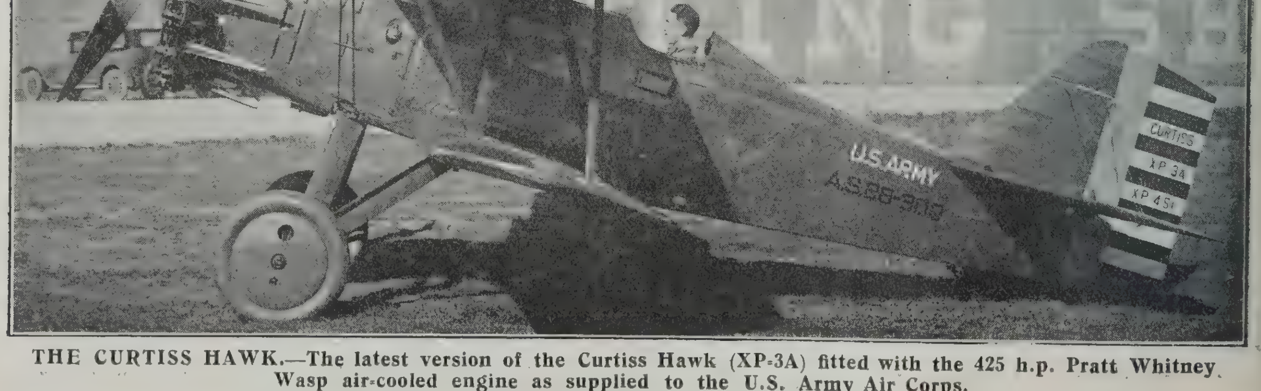
When once this method of control is adopted we shall have practically finished with all accidents caused by stalling and spinning and nose-diving.

Of course, bad pilots will still run into things on landing and break their necks. And all sorts of other accidents will happen. Slots themselves may break or jam, till we learn all about how to fit them. But at the most moderate estimate we shall have reduced the proportion of accidents by at least 50 per cent. And that ought to make flying at least as safe as motoring.

Future Safeguards.

Having achieved speed and safety there is no foresee-able end to the future of flying. The history of all other methods of transport will repeat itself.

Safety will increase the number of people who want to fly, the increase in the number of people who want to fly will increase the number of users of air lines and air taxis, and it will increase the number of private owners. The increase



THE CURTISS HAWK.—The latest version of the Curtiss Hawk (XP-3A) fitted with the 425 h.p. Pratt Whitney Wasp air-cooled engine as supplied to the U.S. Army Air Corps.

Consider these Facts!

WHEN you purchase a Napier engine you are buying reliability combined with high efficiency.

Notwithstanding the high performance obtainable with the Napier Lion, this performance can be relied upon for long periods without overhaul.

The Napier engines employed by Imperial Airways on strenuous day in, day out service, fly 30,000 miles between each overhaul. Some Napier engines in the Royal Air Force have given even better service than this.

Consider this very important point before deciding on your engines for 1928.

Again, for reliability and speed no other engine has such a splendid record to its credit. Twice have four Napier-engined Fairey machines flown from Cairo to Cape Town and back—100,000 engine miles—whilst the fastest race in the World was won by a Supermarine-Napier seaplane fitted with a Napier engine. Average speed, over 217 miles—281.669 m.p.h.

To obtain the best results install the engine which has proved itself during nine years' continuous commercial and R.A.F. service, the

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in the number of passengers and pilot-owners will increase the number of aeroplanes used and so will reduce the cost of manufacture.

We shall have bigger and better air-line machines and we shall have cheaper machines for private owners.

Quite possibly even middle-aged members of the aeronautical community to-day may live to see the mass production of aeroplanes on the lines of the Morris and the Ford.

Then we shall be up against new problems to avoid collision in the air. Besides lighted turn-indicators to show us what we are doing in fogs we shall want some kind of ray to show us when we are dangerously close to some unseen aeroplane. And such a device will be quite necessary even in a clear sky with machines travelling at four or five miles a minute.

Convenience.

Some people talk cheerfully of air-line machines to carry 100 or 200 passengers. Such things may happen. But personally one imagines that a machine carrying about 20 or 25 people is as big as is necessary.

When we want to go to the Continent, instead of having to tie ourselves down to certain trains connecting with certain boats in the day, it will be much more convenient just to go down to the aerodrome and take the next machine, knowing that there is sure to be one starting within the next quarter of an hour. Forty machines a day with 20 passengers apiece would be much more convenient than, say, four boats with 200 passengers apiece.

Trans-Atlantic Safety.

Naturally we shall have a trans-Atlantic air service some day. Probably it will first be run by airship. But there seems to be some curious natural law that the speed of the fastest ship shall only be about half that of the fastest aeroplane. At the present moment it is something less than one-third of that speed. But that is only because the airship has been so much neglected for the past six or seven years, owing to lack of money.

Naturally the Atlantic, or any other trans-oceanic service, will be done with big flying-boats. But competent aircraft designers believe that no flying-boat could ever be built to stand up to a first-class Atlantic gale, if forced to alight.

Therefore we shall probably have to come back to quite an old idea, originated by that inventive genius, Mr. Pemberton Billing, in which the wings, engines and tail of the flying-boat will be built as one unit, the hull being a sea-worthy motor-boat which is clamped to it.

This has the further advantage that at the terminal harbours the machine can come down on the water, moor its immense wing and tail unit to buoys, and the boat hull can then proceed up to the dock to unload and reload passengers and freight. It is quite a simple engineering proposition.

Air Survey.

At the present moment almost the only truly commercial development of Civil Aviation is air survey. Here immense strides are being made.

Already a country can be mapped by air at a fraction of the price that map-making would cost by ground methods.

Experienced observers can already tell not only the quality of forests but the actual quality of the ground over which they are flying, whether it is suitable for certain crops, whether it contains certain minerals and so forth.

By air mapping the revision of the ordnance survey of Great Britain, which now takes twenty-five years to do, could easily be done in a year, so that complete new sets of ordnance maps could be issued once every three years. This will probably be found necessary within the next five or ten years, thanks to the enormous amount of road building and town planning that is going on in this country.

Special air survey machines are now being built and no doubt from these we shall develop regular flying dark-rooms, which will go aloft, fly over certain territory for two or three hours, and come down with photographs of a few hundred square miles of territory all ready developed and printed.

The War Value of Speed.

To turn to the Service side, some quite interesting developments are obvious. Some people ask what is the war value of our 300 mile an hour racing machines. Their value, one imagines, is as true scouts.

For the last thirteen years the word scout has for some contrary reason indicated a single-seat fighting machine. But the real scout of the future ought to be one which can leave Headquarters, fly to a point between 200 and 250 miles away and be back again inside two hours with ready-developed photographs of the movements of enemy troop-trains and mobile columns at that point.

When we are fighting a mobile war all over the plains of Central Europe, with mechanical transport and high-speed tanks and so forth opposed to clouds of light cavalry, the fighting area itself may very well sway a hundred miles in either direction in a day. So obviously instead of having to go scouting 20 or even 50 miles behind a fixed fightin line and calling it a day's work, as was the custom of 1914-1 the scout in the next war will have to go a couple of hundre miles at least behind the enemy's supposed front, and th quicker he can do it the better he will be pleased.

Ground Catapults.

Another effect of such mobile warfare will be that bas aerodromes will have to be hundreds of miles away from th battle area if they are to be safe from attack on the ground let alone attack from the air. Consequently we shall not b able to have even advanced landing grounds prepared any where near where fighting is going on.

Colonel J. F. C. Fuller, writing on "Problems of Air War fare" in the Journal of the Royal Artillery for October says :—

> If it were feasible to devise a landing ground the size of a tenni lawn and roll it up and unroll it horizontally on any norma ground surface, a far greater step towards the abolition of armie and fleets would be accomplished than can possibly be attained b all the tactical experiments now being carried out. In brief, th future of air power is not to be sought in the air, but on the ground for the ground is the bed and the belly of the aeroplane.

Colonel Fuller is the High Priest of mechanical transpor in the Army. But evidently he has not taken much interes in aircraft. For he has not struck the very simple solution of this apparently, to him, difficult problem.

For years the United States Navy has been launching its seaplanes from catapults. The first one must have been used fully ten years ago And the British Navy has now several quite good catapults for the use of the Fleet Air Arm of the R.A.F.

There seems to be no vast mechanical difficulty about building portable catapults for use on land. They would not work out very much bigger than an ordinary fire-escape. And with slotted wings, as they will ultimately be developed, together with adequately absorbent undercarriages, it will be possible to drop an aeroplane down flat at a standstill on any ordinary road or flat piece of ground.

Long before the War any first-class box-kite pilot could drop his machine at a standstill onto a pocket handkerchief. And with modern controls it ought to be still easier.

With the development of variable-pitch airscrews we may even be able to check the machine at the right moment by going astern.

A Naval View.

Some Service people seem to be looking quite a long way ahead, for Admiral Madden, speaking at the banquet to our Schneider Trophy Team, said that what the Navy wanted was a seaplane which could be dropped overboard like a lifebuoy.

This strikes one as going a little too far—quite apart from the fact that in really heavy weather the pilot would probably find ordinary catapulting more comfortable.

Still, the idea of an unbreakable self-righting seaplane which can be hove overboard, like dropping an india-rubber duck into a bath, is fascinating, and some of the bright young designers of future generations may achieve even that. At any rate the idea has a certain naval heartiness about it.

One has dealt very sketchily with these future possibilities of flying. Working along the same lines from what we know to have been already achieved, the future possibilities seem almost limitless. One can only hope that these suggestions may lead to arguments from which practical developments will arise.—C. G. G.

U.S. AIR APPROPRIATIONS.

On Dec. 5, the U.S. Budget for 1928-29 was presented to Congress, and the principal appropriations for aeronautics all show increases over those of last year. Last year's Budget was the first to make appropriations under the "Five Year Development Programme" for the Army and Navy Air Services, as set forth in the Air Commerce Act of 1926.

The following are the principal air appropriations in this year's Budget, the figures in brackets showing the increases over those of the 1927-28 Budget: Army Air Corps, $25,035,562 ($4,432,968); Navy Bureau of Aeronautics, $32,939,800 ($12,639,800); Department of Commerce, $702,000 ($2,000); Post Office Department, $6,000,000 ($4,000,000); National Advisory Committee for Aeronautics, $600,000 ($75,000); Totals, $68,487,212 ($21,268,118).

Contract allowances of $5,000,000 for the Army Air Corps and $10,000,000 for the Navy Bureau of Aeronautics, increase the total to $83,487,212.

The principal increase in the Army Air Corps vote is that for the purchase of new aircraft and equipment, which amounts to $11,257,445, an increase of $1,764,895 over the previous year.

In the Navy vote a sum of $1,800,000 is allowed towards the construction of a rigid airship, the total cost of which is limited to $4,500,000.

PRODUCTION

As the result of the adoption of the Fairey IIIF by the British Air Ministry as well as by Colonial and Foreign Governments, the Fairey Aviation Company are now producing the General Purpose and Fleet Air Arm types of this aircraft in large quantities. This building activity is the result of producing a high performance aircraft capable of undertaking the varied requirements of the Royal Air Force (including both its Naval and Military spheres of operation) and to fulfil these requirements without loss of performance.

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OUR OPPORTUNITIES IN CANADA.

[*The following letter has been received from a correspondent in Canada, which refers back to a letter which was published in* The Aeroplane *on Oct.* 26, 1927. *It is published in full, and without comment.*]

I was most interested in reading a letter from Mr. D. Atkinson in one of your past issues, and your occasional comments on the subject treated by him. You will perhaps remember that Mr. Atkinson was inclined to criticise the lukewarmness of the English manufacturers in supplying our needs in Canada. He also stated fairly completely what our needs were in the way of a plane to operate here.

Mr. Atkinson is one of our well known pilots. I have flown with him on several occasions myself. He is thoroughly conversant with conditions here, and his letter will be subscribed to by everyone who has much experience in flying in Canada.

Are we to believe that the spirit of enterprise is dying out in the dear old land? Reluctantly, I am coming to that conclusion. The same indifference that is manifested in the airplane industry is also evident in other lines. Mining, for instance. We have here without a shadow of doubt the greatest potential mining field in the world, but I found from experience when I visited England about eighteen months ago that British mining men were unwilling to come here and compete under the conditions prevailing here. In other words, they wanted conditions made to their own order, and refused to adapt themselves to anything different.

Last year I started a correspondence with various firms manufacturing airplanes—one in England and some in the States. The English firm stated they had not yet fitted their machine with floats, but were proceeding to do so, and would communicate with me later. I never heard from them again, although I saw by an advertisement in The Aeroplane that they had equipped their plane with the floats. This is in decided contrast to the American firms, all of whom followed up the lead persistently, and some of whom are still advertising their product to me after no more encouragement than that given to the English firm. This winter I am buying an American plane—needless to say, built around the Wright Whirlwind engine. I am compelled to do this from sheer inability to purchase what I want in England.

It may be that there is no great profit in the manufacture of airplanes without the help of a Government subsidy. Of this I know nothing. But I do believe there is a great field here if any firm will grab the opportunity. I predict that in ten or twenty years there will be more commercial planes in operation here in Canada than in Great Britain. If the English manufacturers want it, however, they must " get a move on."

No, Mr. Editor, we are not pro-American at heart—far from it, but we like to see the old man taking more than a casual interest in the growing child. If he doesn't, somebody else will.

TOWARDS THE EAST.

At 10.30 hours on Jan. 9 Flg. Offs. J. S. Newall and Nevill Vintcent, D.F.C., left Stag Lane for Brussels on two D.H.9 type biplanes (240 h.p. Siddeley Puma engines) on a flight towards the East.

The expedition consists of the above two officers, who are on half-pay, at their own request, Mr. W. S. King, engine mechanic, and Mr. W. A. Childs, who, in addition to being a photographer, is a rigger and fitter. A paying passenger, Mrs. Wise-Parker, is being carried as far as Cairo.

The two D.H.9's are fitted with enclosed cabins with accommodation for three passengers each, rubber-in-compression undercarriages, D.H.50-type nose-radiators and Dunlop motor-car-type tyres in place of the ordinary aeroplane tyres to reduce the risk of punctures.

The object of the expedition, which is being financed equally by the two officers, is to make a survey of the air transport possibilities in India, Burma and the Federated Malay States, and incidentally to disseminate propaganda by demonstration and passenger flights along their route. The following shows the extent of the programme which they intend to carry out :—to run medium-range air services between more or less inaccessible centres; to demonstrate the possibilities of air survey by taking photographs from the air; to discuss the use of aircraft in dusting crops; to collect meteorological data, such as reports on natural landing grounds, seaplane bases and flying conditions generally; to demonstrate the use of special charter aircraft for quick business communication; and to stimulate interest generally in aviation by giving passenger flights and lectures at big towns.

The expedition is expected to last six months, the greatest proportion of which will be spent in India, Burma and the Federated Malay States. At Calcutta the two D.H.9's will be fitted with floats, and as seaplanes they will be flown to Ceylon and back down the east coast of India.

Both officers have spent a considerable amount of time in the East. Flg. Off. Vintcent has had, in addition to his R.A.F. service in Egypt, 'Iraq and India, a considerable amount of experience with the Air Survey Company in Borneo and the Malay States, and Flg. Off. Newall has served in the Fleet Air Arm in the Mediterranean, at Singapore and in China.

The whole flight, which has possibilities of great value to Imperial aviation, has the full support of the Air Ministry, and from certain tentative offers already received from various places along their proposed route it would appear that the expedition is likely to achieve the success which it and its enterprising organisers thoroughly deserve.

TOWARDS THE EAST.—The personnel of the Expedition which left Stag Lane on Jan. 9 for the East. From left to right : Mr. W. A. Childs, Flg. Off. Newall, Mrs. Wise-Parker, Flg. Off. Vintcent, and Mr. W. S. King.

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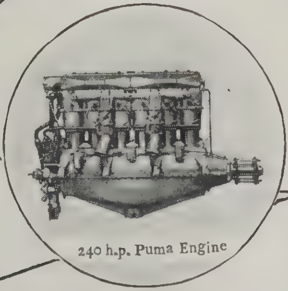
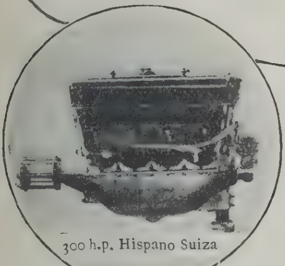


240 h.p. Puma Engine

Avro type, 504K.



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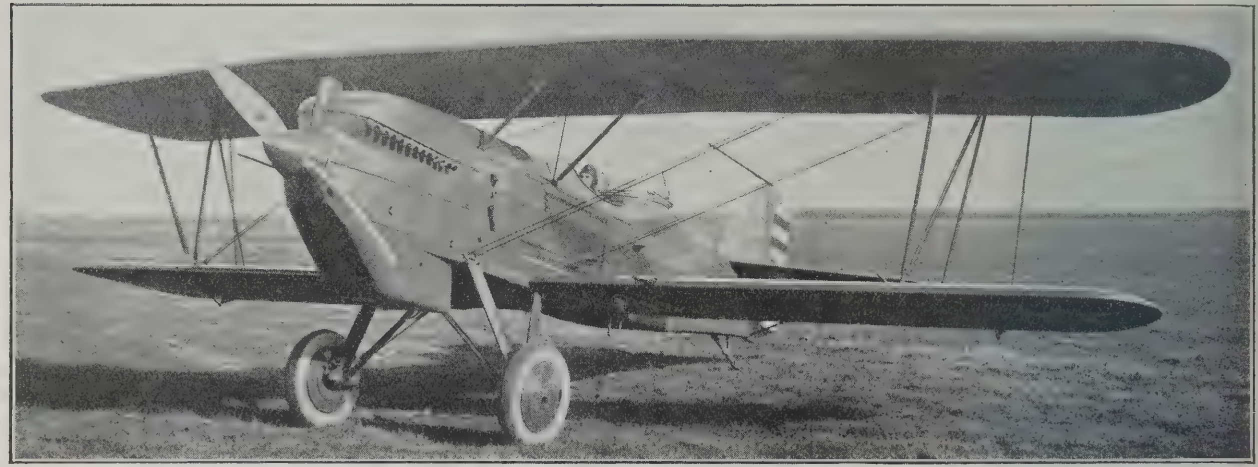
CURTISS FALCON DEVELOPMENTS.



THE CURTISS A-3.—The latest version of the Curtiss Falcon equipped for Ground Attack purposes. One of the four fixed Browning guns can be seen protruding from the leading edge of the bottom plane.

The Curtiss Falcon two-seat observation biplane was originally produced some three years ago to compete in a competition, the purpose of which was to choose equipment to replace the old D.H.4B as the standard observation machine in the U.S. Army Air Service.

It is to all intents and purposes a two-seat version of the Curtiss Hawk single-seater, the principal outward difference, apart from the increase in size, being the fitting of a backswept top plane.

As an observation machine three types are now being produced. The O-1B, fitted with the 440 h.p. Curtiss D-12 engine, the latest development of the original machine is now in use in the U.S. Air Corps. A variant of this type for use by both the Air Corps and the National Guard is fitted with the 400 h.p. Liberty engine, and still another type for the Air Corps and the Marine Corps is equipped with the 425 h.p. Pratt and Whitney Wasp air-cooled radial engine.

The latest development of this series, known as the A-3, has been designed for Ground Attack purposes, and this machine differs from the O-1B only with regard to the comprehensive armament fitted.

This armament consists of two Browning 30 calibre guns in the cowling firing through the airscrew, two similar guns one mounted in each bottom plane firing outside the airscrew disc, and twin Lewis guns on a Scarff ring mounted over the observer's cockpit. The two wing guns are arranged so that only the muzzle protrudes through the leading edge and several hundred rounds of ammunition are carried within the wings. These guns are operated by electric triggers and are so arranged that they can be fired independently or simultaneously.

In addition to the above, two bomb racks are fitted into the under surface of the bottom wings and these can carry twenty five-pound fragmentation bombs which can be released individually or in salvo by the pilot.

Another version of the A-3 is being produced for the Air Corps and Marine Corps fitted with the Pratt and Whitney Wasp engine and is exactly similar except for the change in engines.

In preliminary tests the A-3 has made a top speed of 147 m.p.h.

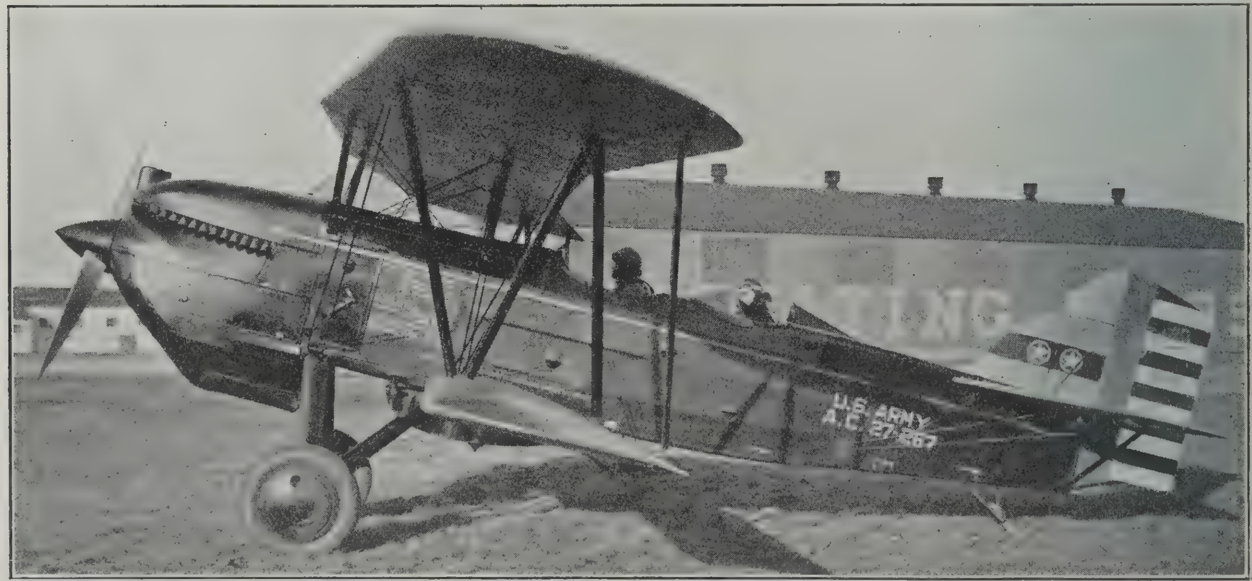
Four standard Falcon O-1 biplanes (440 h.p. Curtiss D-12 engines) have recently been completed for the official use of Major-Gen. J. E. Fechet, the Chief of the Air Corps, Brig-Gen. W. E. Gillmore, Chief of the Material Division of the Air Corps, Col. H. McRider, Assistant Secretary for War, and Mr. F. Trubee Davison, Assistant Secretary of War for Aviation.

The back cockpit of each machine has been upholstered, in leather, fitted with a folding table and a special instrument board and a roomy baggage compartment for suitcases and personal effects is provided. Each machine is also fitted with dual control.

The Curtiss Falcon two-seat observation biplane has also been experimentally converted into a seaplane. The conversion consists of the substitution of a single central float and two small wing-tip floats for the standard wheel undercarriage.

The main float is built of wood using a shell of two-ply mahogany planking over a wooden skeleton. This float is of the concave vee-bottom type with a single step.

Flying tests have not yet begun but according to wind-tunnel tests the Falcon seaplane is estimated to be slightly faster than the same machine equipped as a landplane.



FOR OFFICIAL USE ONLY.—A special Curtiss Falcon equipped for the personal use of Brig.-Gen. E. Fechet, Chief of the U.S. Air Corps. The rudder marking, consisting of one vertical blue stripe and alternate red and white horizontal stripes, is now standard in the Army Air Corps.

THE ROYAL AIR FORCE.

The London Gazette.

Jan. 3.

GENERAL DUTIES BRANCH.—The following airmen pilots are granted perm. comns. as Plt. Offs. on probation with effect from and with seniority of Dec. 30, 1927:—157374 Sjt. L. S. Snaith, 142497 Sjt. C. S. Ellison, 330552 Sjt. R. L. Mills, 335392 Sjt. M. Lowe.

The following are granted S.S. comns. as Plt. Offs. on probation with effect from Dec. 13, 1927, and with seniority of Dec. 9, 1927:—E. E. Carter, W. F. Murray, J. A. S. Outhwaite. The following are granted S.S. comns. as Plt. Offs. on probation with effect from Dec. 14, 1927, and with seniority of Dec. 9, 1927:—M. M. Freeman, G. F. Hales, C. H. R. Little, C. Stephenson. The following are granted S.S. comns. as Plt. Offs. on probation with effect from Dec. 16, 1927, and with seniority of Dec. 9,, 1927:—H. R. R. Ackerley, S. O. Bufton, P. H. E. Grisewood, D. B. McGill, G. Wood.

Sq. Ldr. J. H. O. Jones is seconded for duty with the British Naval Advisory Staff in Chile (Dec. 19, 1927).

Plt. Off. on probation L. S. Rollings resigns his S.S. comn. (Dec. 19, 1927).

STORES BRANCH.—Flg. Off. A. E. Evans, D.F.C., is granted a perm. comn. in this rank with effect from May 21, 1927, on completion of probationary service.

RESERVE OF AIR FORCE OFFICERS.—GENERAL DUTIES BRANCH.—A. G. Lamplugh is granted a comn. in Class A as a Flg. Off. (Dec. 30, 1927). The following are granted comns. in the Special Reserve as Plt. Offs. on probation:—J. F. Bristow, J. A. Hall, W. O'B. Knox, C. E. W. N. C. Pelly (Dec. 21, 1927).

The following Plt. Offs. are promoted to the rank of Flg. Off.:—E. E. Fresson (Nov. 17, 1927); F. G. Wayman (Dec. 1, 1927); H. Bradley (Dec. 7, 1927); Ll. J. C. Harding (Dec. 7, 1927); J. H. Simpson (Dec. 14, 1927); R. E. Watson (Dec. 14, 1927); T. J. Tingley (Dec. 29, 1927).

Flg. Off. H. G. Harper relinquishes his comn. on completion of service (Dec. 23, 1927); Flg. Off. Doctor R. L. Powell relinquishes his comn. on completion of service, and is permitted to retain his rank (Sept. 12, 1927). (Substituted for the notification in the *Gazette* of Nov. 22, 1927.)

AUXILIARY AIR FORCE.—GENERAL DUTIES BRANCH.—NO. 600 CITY OF LONDON (BOMBING) SQUADRON.—Flg. Off. A. G. Lamplugh resigns his comn. on appointment to the R.A.F.O. (Dec. 30, 1927).

Appointments.

Week ending Jan. 10.

GENERAL DUTIES BRANCH.—Air Commodores B. C. H. Drew, C.M.G., C.B.E., to No. 23 Group H.Q., Grantham, for duty as Air Officer Commanding, 15/12. I. M. Bonham-Carter, C.B., O.B.E., to R.A.F. Depot, Uxbridge, 15/12.

Group Captain C. T. Maclean, D.S.O., M.C., to R.A.F. Depot, Uxbridge, 12/12.

Wing Commander R. G. D. Small, to No. 1 F.T.S., Netheravon, pending taking over command, 19/12.

Squadron Leader C. N. Lowe, M.C., D.F.C., to No. 43 Sqdn., Tangmere, 25/12.

Flight Lieutenant E. T. Carpenter, A.F.C., to R.A.F. Base, Gosport, 5/1.

Flying Officers J. B. Wilson, to R.A.F. Training Base, Leuchars, 1/1. A. L. R. Duke, to C.F.S., Wittering, 2/12. J. J. Nolan, to R.A.F. Depot, Uxbridge, 21/1. E. A. H. Fisher, to R.A.F. Depot, Uxbridge, 7/11. A. W. B. Hale, to No. 440 Flight, 13/12. L. L. King, to M.A.E.E., Felixstowe, 5/1. J. W. Vanderbeeck, to R.A.F. Depot, Uxbridge, 1/1. J. V. Yonge, to No. 16 Sqdn., Old Sarum, 24/1. J. S. Phillips, to R.A.F. Depot, Uxbridge, 18/12. G. A. R. Muschamp, to R.A.F. Station, Donibristle, 6/1. W. G. Wainwright Fahey, to R.A.F. M.T. Depot, Shrewsbury, 11/1. P. W. Lowe-Holmes, to No. 11 Sqdn., Netheravon, 21/12.

Pilot Officers J. D. F. Bruce, to No. 99 Sqdn., Bircham Newton, 19/12. H. A. G. Comerford, to No. 16 Sqdn., Old Sarum, 19/12. W. G. H. Ewing, to No. 4 Sqdn., Farnborough, 19/12. G. A. G. Johnston, to No. 13 Sqdn., Andover, 19/12. R. J. P. Morris, to No. 99 Sqdn., Bircham Newton, 19/12. H. F. Suren, to No. 7 Sqdn., Worthy Down, 14/1. C. S. Ellison, to C.F.S., Wittering, on appointment to a Perm. Comn., 30/12. M. Lowe, to No. 29 Sqdn., Duxford, on appointment to a Perm. Comn., 30/12. R. L. Mills, to M.A.E.E., Felixstowe, on appointment to a Perm. Comn., 30/12. L. S. Snaith, to No. 5 F.T.S., Sealand, on appointment to a Perm. Comn., 30/12. The undermentioned Pilot Officers are posted to the R.A.F. Depot, Uxbridge, on appointment to S.S. Comns. (on probation), with effect from 30/12:—H. Bailey, V. S. Bowling, G. C. Butler, C. W. F. Carter, N. W. Creasy, R. N. Dashwood-Tandy, W. H. B. de Courcy-Wheeler, B. G. D'Olier, E. D. Elliott, D. A. Forbes, W. R. Hartwright, J. O. C. Huggett, T. Joyce Clarke, J. B. MacKenzie, K. I. F. C. Norman-Wright, N. C. Odbert, P. B. T. Rowland, B. P. Silk, J. H. T. Simpson, J. S. Tanner, W. R. Tope, R. C. Warner, W. R. C. Wilkins, and L. E. A. Wright. J. B. Fyfe, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn. (on probation), 31/12. R. A. E. Birch, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn. (on probation), 2/1.

MEDICAL BRANCH.—Squadron Leaders R. W. Ryan, M.B., to R.A.F. Depot, Uxbridge, 3/12. F. E. Johnson, to R.A.F. Depot, Uxbridge, 3/12.

Flight Lieutenants C. V. D. Rose, to R.A.F. Depot, Uxbridge, 3/12. T. V. O'Brien, M.B., to R.A.F. Depot, Uxbridge, 24/12. L. C. Palmer-Jones, M.B., to No. 208 Sqdn., Middle East, 3/12. Flight Lieutenant (Dental) M. J. O'Reilly, to R.A.F. General Hospital, 'Iraq, 11/11.

Flying Officer J. Magner, M.B., to Aircraft Depot, India, 17/11.

STORES BRANCH.—Flight Lieutenants C. H. Pownall, to R.A.F. Station, Kenley, 19/1. E. C. Farman, to Fighting Area H.Q., Uxbridge, 10/1.

R.A.F. Control at Aden.

In the near future the defences of Aden will be placed under the command of a Royal Air Force officer.

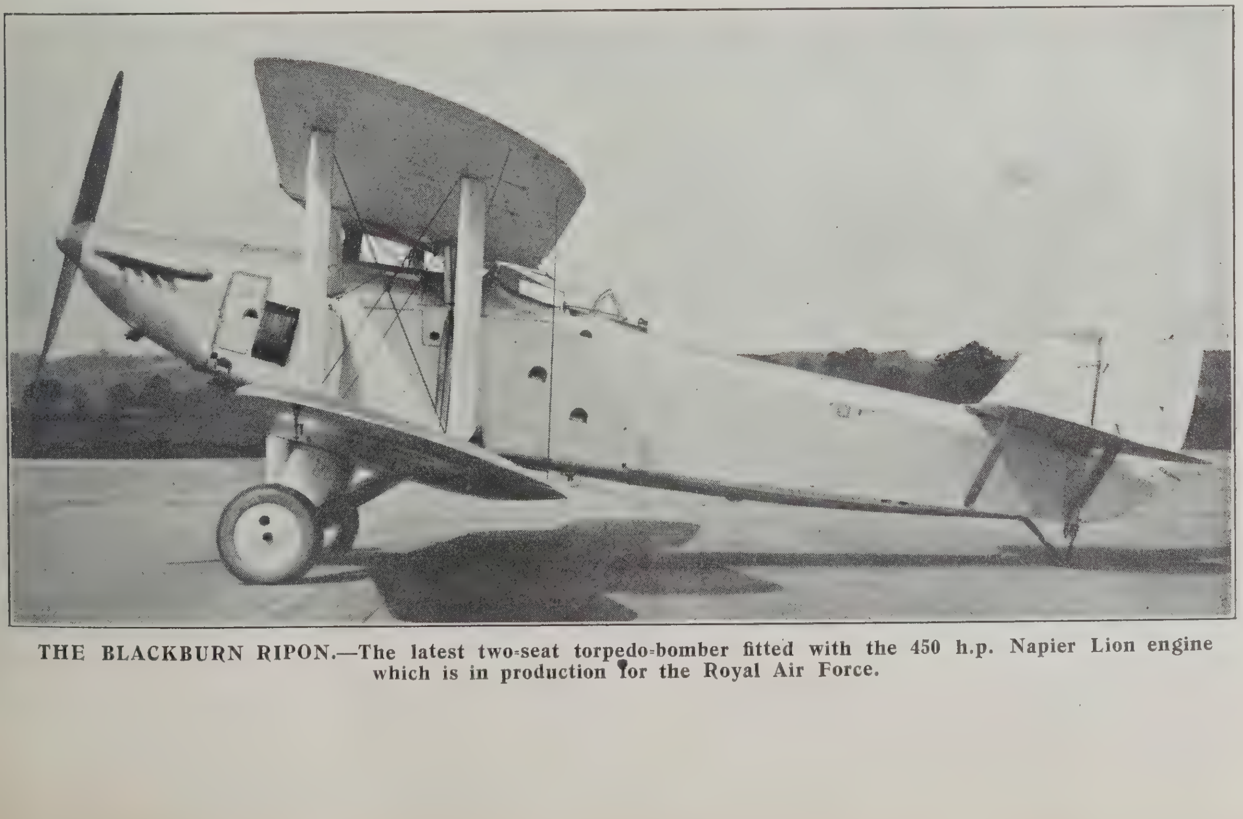
Until last summer Aden was administered by the Government of India. The area was then taken over by the British Government. Since Aden became an integral part of the British Empire it has been garrisoned by regular troops and has had the standing of a Brigade command. In future such Army units as are in the station will be under the command of the senior R.A.F. officer in Aden. This is the third case in which R.A.F. officers command the whole of the defence forces in an area. The other two cases are Palestine and 'Iraq.

No. 8 (Bombing) Squadron, R.A.F., which is stationed at Aden and commanded by Sq. Ldr. W. A. McClaughry, D.S.O., M.C., D.F.C., is being re-equipped with the Fairey IIIF. General Purposes biplane (Napier Lion engines). No. 8 (Bombing) Squadron was previously equipped with D.H.9as.

The R.A.F. in India.

The India Office has definitely announced that two more Squadrons are to be added to the R.A.F. establishment in India during 1928.

This statement by the India Office is particularly noteworthy in that it announces the establishment of two



THE BLACKBURN RIPON.—The latest two-seat torpedo-bomber fitted with the 450 h.p. Napier Lion engine which is in production for the Royal Air Force.

Squadrons of the Royal Air Force at the expense, not of the British taxpayer, but of the Government of India.

The two new Squadrons will be formed in India about the autumn of 1928 and will be equipped with machines of the General Purposes type.

At present the R.A.F. in India consists of H.Q., India, three Wing H.Q.'s, one Aircraft Depot, with a Port Detachment, one Aircraft Park, a Central Accounts Office, two Bombing Squadrons, and four Army Co-operation Squadrons.

The New Squadrons.

In the Air Estimates for the financial year 1927-28 provision was made for two new Regular and one non-Regular Squadrons for Home Defence. One of the Regular Squadrons, No. 10 (Bombing) Squadron, is now being formed at Upper Heyford under the command of Wing Cdr. H. R. Busteed, O.B.E., A.F.C., as stated in The Aeroplane of Nov. 30, and will eventually be equipped with Handley Page Hinaidis (two Jupiter engines).

The second Regular Squadron will be formed before the end of the financial year. This will be No. 101 (Bombing) Squadron, and it will be formed at Eastchurch and will be equipped, to begin with, with Vickers Virginias (two Napier Lion engines). These machines will later be superseded by Boulton and Paul Sidestrands (two Bristol Jupiter engines).

The non-Regular Squadron will also be formed before the end of the financial year and will be No. 504 (Special Reserve) Squadron and will be stationed at Hucknall and equipped with Fairey Fawns (Napier Lion engine).

No. 84 Bombing Squadron.

No. 84 (Bombing) Squadron, R.A.F., which has been stationed at Shaibah, Basrah, for some years, is being moved to Hinaidi, Baghdad. The Squadron is to be re-equipped with Westland Wapiti General Purposes machines (Bristol Jupiter Mark VI engines).

No. 84 (Bombing) Squadron, which is commanded by Sq. Ldr. F. J. Vincent, D.F.C., is at present equipped with D.H.9as.

Commands and Staff.

Air Commodore B. C. H. Drew, C.M.G., C.B.E., whose appointment as Air Officer Commanding No. 23 Group, Spittlegate, is dated Dec. 12, 1927, was born in 1880 and entered the Indian Army in 1900. He saw service in China in 1900 and on the N.W. Frontier of India from 1902 to 1904. He was awarded a Brevet Majority in Sept., 1914, and became a G.S.O. III in Dec., 1915, G.S.O. II in Feb., 1916, and Lt.-Col., R.F.C., in Feb., 1918. He was awarded the G.M.G. in June, 1918, and the C.B.E. in June, 1919. After the Armistice he was appointed to H.Q. Middle East for Air Staff Duties, and in 1922 he was appointed to command the Egyptian Group. He was promoted to the rank of Air Commodore in January, 1922. In August, 1924, he was appointed to H.Q. Inland Area for duty as Chief Staff Officer.

Wing Cdr. R. G. D. Small, whose appointment to No. 1 F.T.S., Netheravon, pending taking over command is dated Dec. 19, 1927, was born at Keynsham, in 1887 and educated at Clifton and the R.M.C., Sandhurst. He entered the 2nd Battn. The Leinster Regt. in 1908. He learned to fly on a Grahame-White biplane at Hendon and his Royal Aero Club Certificate Number 492 is dated Feb 18, 1913. He was seconded to the R.F.C. in September, 1913, and went overseas with No. 4 Squadron on Aug. 13, 1914. He served in France throughout the war and was mentioned in dispatches three times. In 1922 he was posted to No. 10 Group, Lee-on-Solent. In 1925 he was appointed to command the R.A.F. Station at Duxford, where he remained until he was posted to the R.A.F. Depot, Uxbridge.

Sq. Ldr. C. N. Lowe, M.C., D.F.C., whose appointment to command No. 43 Squadron is dated Dec. 25, 1927, was educated at Dulwich College and Pembroke, Cambridge. He entered the A.S.C. as a 2nd Lieut. in August, 1914, and was appointed Flying Officer, R.F.C., in September, 1916, and Flight Commander in February, 1917. He was awarded the M.C. "for conspicuous gallantry and devotion to duty" and the D.F.C. for "destroying five enemy machines and driving down two others out of control, etc.". After the Armistice he was appointed to the staff of the R.A.F. Cadet College, Cranwell, and in 1923 he was posted to the R.A.F. Depot, Uxbridge. He was promoted to the rank of Squadron Leader in July, 1925, and appointed to command No. 602 (City of Glasgow) Squadron, Auxiliary Air Force, in September, 1925. In April, 1926, he went to 'Iraq to command No. 1 (Fighter) Squadron, and in November, 1926, he was appointed to command No. 6 (Army Co-operation) Squadron at Mosul. Sq. Ldr. Lowe is an International Rugby Football player and has been capped 25 times for England. He played for the R.A.F. representative team against both the other Services from 1922 to 1926.

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident at Hinaidi Aerodrome to a Bristol Fighter machine of No. 6 (Army Co-operation) Squadron, Mosul, on Jan. 9, Plt. Off. Lionel Edward Ruggles Fisher, M.C., R.A.F., the pilot of the aircraft, was killed, and Lieut. Sidney Gordon Haserick, The King's Own Yorkshire Light Infantry (attached 'Iraq Levies) was dangerously injured.

The Imperial Defence College.

The following officers of the R.A.F. will attend the 1928 course at the Imperial Defence College :—Wing Cdr. J. E. A. Baldwin, D.S.O., O.B.E., *p.s.a.*; Wing Cdr. A. W. Tedder, *q.s.;* Wing Cdr. C. C. Miles, M.C., *q.s.*, and S. Ldr. L. G. S. Payne, M.C., A.F.C., *p.s.a.*

Vacancies in the Accountant Branch.

The Air Ministry announces that an examination will be held in the latter part of March, 1928, under the scheme inaugurated in 1924 for the entry into the Accountant Branch of the R.A.F. of qualified and experienced civil accountants. About 8 vacancies are likely to be available. The age limits are 22 to 26, extensible to 30 for certain candidates having previous service in the Forces.

Application should be made to the Secretary, Air Ministry (S.7.), Kingsway, London, W.C.2, for the regulations and for application forms. Completed application forms should reach the Air Ministry by Feb. 1 next, or at latest by Feb. 15.

Commissions from the Ranks.

The London Gazette of Jan. 3 contains the names of four airmen pilots who have been granted permanent commissions as Pilot Officers on probation. The following are the units to which these airmen pilots belonged before they were posted on being granted their commissions :—Sjt. Snaith, No. 2 Flying Training School, Digby; Sjt. Ellison, No. 216 (Bombing) Sqdn., Egypt; Sjt. Mills, R.A.F. Base, Calshot; Sjt. Lowe, No. 32 (Fighter) Sqdn., Kenley.

The Far East Cruise.

A dinner was given to the Far East Flight on Dec. 19 at the Taj Mahal Hotel, Bombay, by former personnel of the Flying Services living in Bombay. In the absence of Sir Victor Sassoon, who was unable to attend, Mr. C. M. Eastley (No. 31 and No. 114 Squadrons) was in the chair.

After the toast of the King-Emperor, the Chairman proposed the toast of The Guests and welcomed the Flight on behalf of all ex-aviators in Bombay. He said that the progress of the Cruise was being followed with the liveliest interest and pride in Bombay and the moral effect of it in the whole British Empire was Imperial in the fullest sense of the word.

Replying for the Guests, Group Capt. Cave-Browne-Cave expressed their deep appreciation of the welcome that had been accorded them. They realised that they were fortunate to be taking part in the cruise and they also realised that they had a great responsibility for wherever they went they felt that the present Air Force was being judged by them. Group Capt. Cave-Browne-Cave then called on the Flight to drink the health of their hosts.

The hosts of the evening included :—

Messrs. A. B. Batemen, C. W. Ward, H. C. Short, G. B. Coward, J. Farrar-Winn, C. E. Briggs, J. Hamilton, F. W. S. Jones, G. T. Tait, W. J. Allan, M. H. Fenn, A. F. Judd, H. Toms, M. G. Dover, H. S. Sayer, D. Dawson, R. V. Grove, E. Vevers, T. Robinson, S. Williams, H. A. Marsden, C. E. Corey, Pemberthy, and W. F. List.

The Military Moths.

Owing to a misunderstanding The Aeroplane stated in the issue of Jan. 4 that No. 24 (Communication) Squadron was to be re-equipped with D.H. Moths (Cirrus engines). As a matter of fact only a few Moths are to be added to the Bristol Fighters and Avro Lynxs with which the Squadron is equipped. The other Moths are to be used by the Communication Flight at Andover and the School of Technical Training (Boys) at Halton.

Submarines and Supermarines.

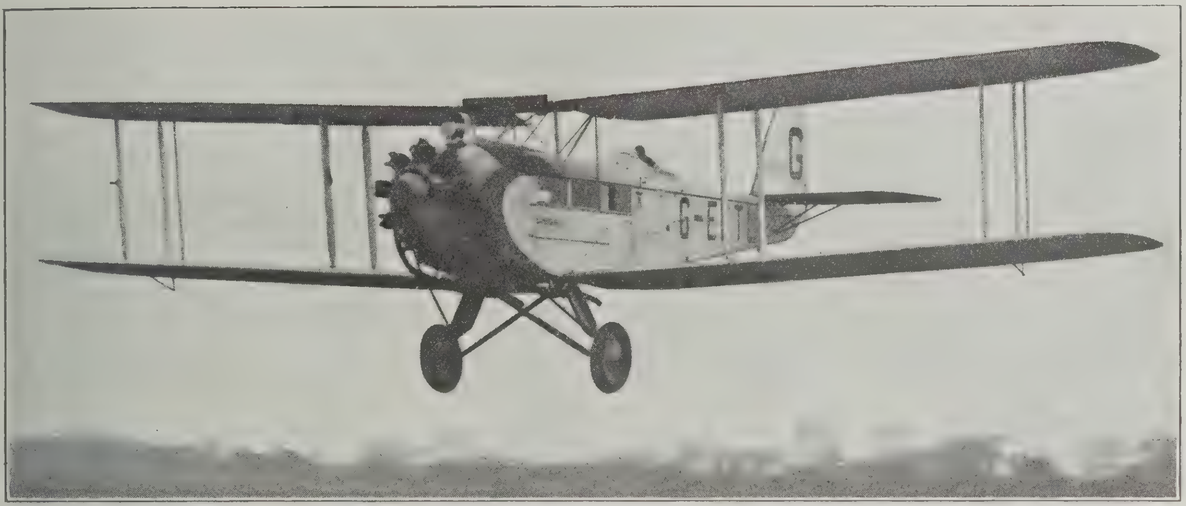
The fuss which has been made in a number of papers recently about the disclosure, by way of the announcement in Admiralty orders of special pay for aeroplane pilots serving in submarines, that we actually have, or intend to have, submarines which carry aircraft, would give the impression that the idea of carrying aircraft in submarines is new. Certain papers have, it is true, said that the American Navy has a submarine carrying a seaplane. And, in fact, the deck of the submarine and the tiny float seaplane which it carries have been illustrated in a number of papers at any time during the last three years.

The best solution of the problem of commercial air transport in the Dominions
—Vide Press.

A NEW COMMERCIAL AIRCRAFT

The D.H. Type 61

Bristol "JUPITER" Engine.



Pay Load ....1,900 lbs.
Rate of Climb...950 ft./min.

With Geared Bristol
"Jupiter" Series VIII.

Top Speed.........132 m.p.h.
Cruising Speed...112 m.p.h.

ACCOMMODATION FOR SIX OR EIGHT PASSENGERS

Two Exceptionally Large Luggage Lockers.

Large and Comfortable Pilot's Cockpit.

BEAUTIFULLY FURNISHED AND QUIET CABIN.

Racks and Shelves for Light Luggage in Cabin.

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FOR OPERATION FROM ROUGH GROUND.

Robust and Simple Construction Throughout.

Every Component Designed for Ease of Maintenance.

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As Easy and Light as a Scout on Controls.

Quick Get Off and Short Landing Run.

AMPLE PERFORMANCE FOR ALL CLIMATES.

Grease Gun Lubrication.

Compressed Air Engine Starter.

Large Wheels and Heavy Tread Tyres.

THE DE HAVILLAND AIRCRAFT CO., LTD.,
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As a matter of fact, the idea of carrying seaplanes in submarines is quite old. It may be even older than 1915, but one distinctly remembers in that year a thoroughly practical scheme being put forward by that versatile genius, Mr. Pemberton Billing, for the bombing of Berlin by seaplanes from the Baltic, the said seaplanes to be conveyed into the Baltic by submarines.

At that time Zeppelin raids were already beginning to shake us pretty badly in this country, but with our usual display of the Non-Conformist Conscience we referred to them as "Hun Atrocities," and disclaimed any intention of reprisals. Of course, no real fighting man ever had any qualms about reprisals, and, like so many fine efforts in that direction, this also was blocked simply by the futility of the politicians, who thought that by not reprising we might win a bit more moral support from comic outside nations, who, in fact, did not matter two hoots.

Anyhow, Mr. Pemberton Billing, who was then still in the Naval Air Service, and at the same time the chief factor in the Supermarine Co., not yet having become a politician, came along with an excellent general lay-out for a tiny single-seat flying-boat with a Mono-Gnome engine, about four hours' petrol, and somewhere between 100 and 200 lbs. weight of bombs. The whole thing was designed so that the wings folded back and the super-structure shut down on a series of interdependent hinges. The whole edifice was connected to one cable, so that when the submarine emerged and the lid was taken off the submarine box in which the flying-boat was carried aft of the conning tower, the pilot simply wound up a winch which by means of this one cable pulled everything up into position, where the pieces locked automatically. The submarine then submerged, leaving the machine afloat, with nothing for the pilot to do except crank up his engine.

Submarines were necessary, because at that date the Germans had heavily mined their coasts and the entrances to the Baltic, and had big warships in the Baltic. So the only chance was for submarines to dive through the minefields unobserved.

The distance from the Baltic coast to Berlin was only a matter of 100 miles. The machines could have dropped their little bombs in Berlin with practical certainty, and excellent moral effect, and with a little luck and a north or north-east wind could either have landed on a Swiss lake, where the pilot might have been interned, or might have escaped, or might have struggled across Holland to the North Sea, or to a lake in France. Anyhow, the scheme was perfectly workable, and it is a pity we never tried it. At any rate, it shows that there is no vast secret about the idea in itself of aircraft in submarines.—C. G. G.

READ MORE IN 1928.

The Best Books about the Air.

ALL THE WORLD'S AIRCRAFT, 1927. C. G. Grey and L. Bridgman. **42s.**

THE OLD FLYING DAYS. C. C. Turner. **25s.**

BASIC PRINCIPLES OF AIR WARFARE. Squadron Leader. **7s. 6d.**

ELEMENTARY AERONAUTICAL SCIENCE. I. B. Hart. **7s. 6d.**

WAR BIRDS, The Diary of an Unknown Aviator. **7s. 6d.**

NOCTURNE MILITAIRE. E. W. Springs. **7s. 6d.**

WE,—PILOT AND PLANE. C. Lindbergh. **7s. 6d**

THE CONQUEST OF THE AIR. C. L. M. Brown. **2s. 6d.**

SUPPLIED BY

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H.M.S. Hermes.

The Times of Jan. 10 states :—

The refit of the aircraft-carrier *Hermes*, belonging to the China Station, is due to be finished at Chatham to-day. The command of this vessel has changed hands during her stay in England, Capt. Ralph Eliot, C.B.E., having been relieved by Capt. Geoffrey Hopwood, C.B.E., from the command of the R.N. Barracks at Chatham. No date is yet announced for her return to the Far East.

The R.A.F. Memorial Fund.

A total number of 268 cases have been dealt with by the R.A.F. Memorial Fund at the offices of the Fund between Oct. 1 and Dec. 31. The amount of the grants made during this period to past and present members of the R.A.F. was £1,978 3s. 5d. and were chiefly in respect of maintenance during sickness, clothing, purchase of tools, payment of arrears of rent, etc. Grants and loans were made to establish small businesses.

Flying Training.

[R.A.F. Flying Training Manual, Part II. Applied Flying. Air Publication 928.] 1s. 6d. net.

A new edition of Part II of the official R.A.F. Flying Training Manual is now published. This part of the Manual deals with Applied Flying and the training of pilots for war.

This volume includes chapters on night flying, air drill, air fighting, attack of airships and kite balloons, and attack on ground objectives, with machine-gun fire and light bombs.

Appendix I is the standard orders for night flying at R.A.F. Aerodromes and Appendix II describes the use of oxygen in high flying.

Copies may be had from THE AEROPLANE Book Dept., 14, Bream's Buildings, E.C.4, at 1s. 9d. each, post free.

R.A.F. SPORTS AND PASTIMES.

Association Football.

The R.A.F. Officers XI beat the Army Crusaders at Uxbridge on Dec. 17 by 3 goals to nil. The ground was hard and slippery with a light coating of snow on the surface. The R.A.F. forwards were lighter and quicker on the ball than the Crusaders and T. E. Worsley was very fast at right back. The first goal was scored by V. Croome from a perfect centre by R. A. Whyte. The R.A.F. broke away in the second half. R. A. Whyte made a long run on the right working inwards and centred near the goal and after a slight mix-up W. J. Millen scored. V. Croome shot the final goal from another run in and quick centre by R. A. Whyte.

The R.A.F. Officers XI beat an A.F.A. Public Schools XI at Uxbridge on Jan. 4 by 3 goals to 2 after leading by 2 goals to nil at half-time.

Hockey.

An alteration has been made in the date of the final R.A.F. Hockey trial, which will now be held on Jan. 14 instead of Jan. 16, as stated in the Hockey Association handbook.

After this trial a team will be selected to represent the R.A.F. against Bedfordshire at Allen Park, Bedford, on Jan. 18.

Flg. Off. C. P. Vines has been selected to play for the Combined Services *versus* the South at Hove on Jan. 28, and Flt. Lt. H. N. Hampton and Flg. Off. J. M. Burd have been chosen as reserves.

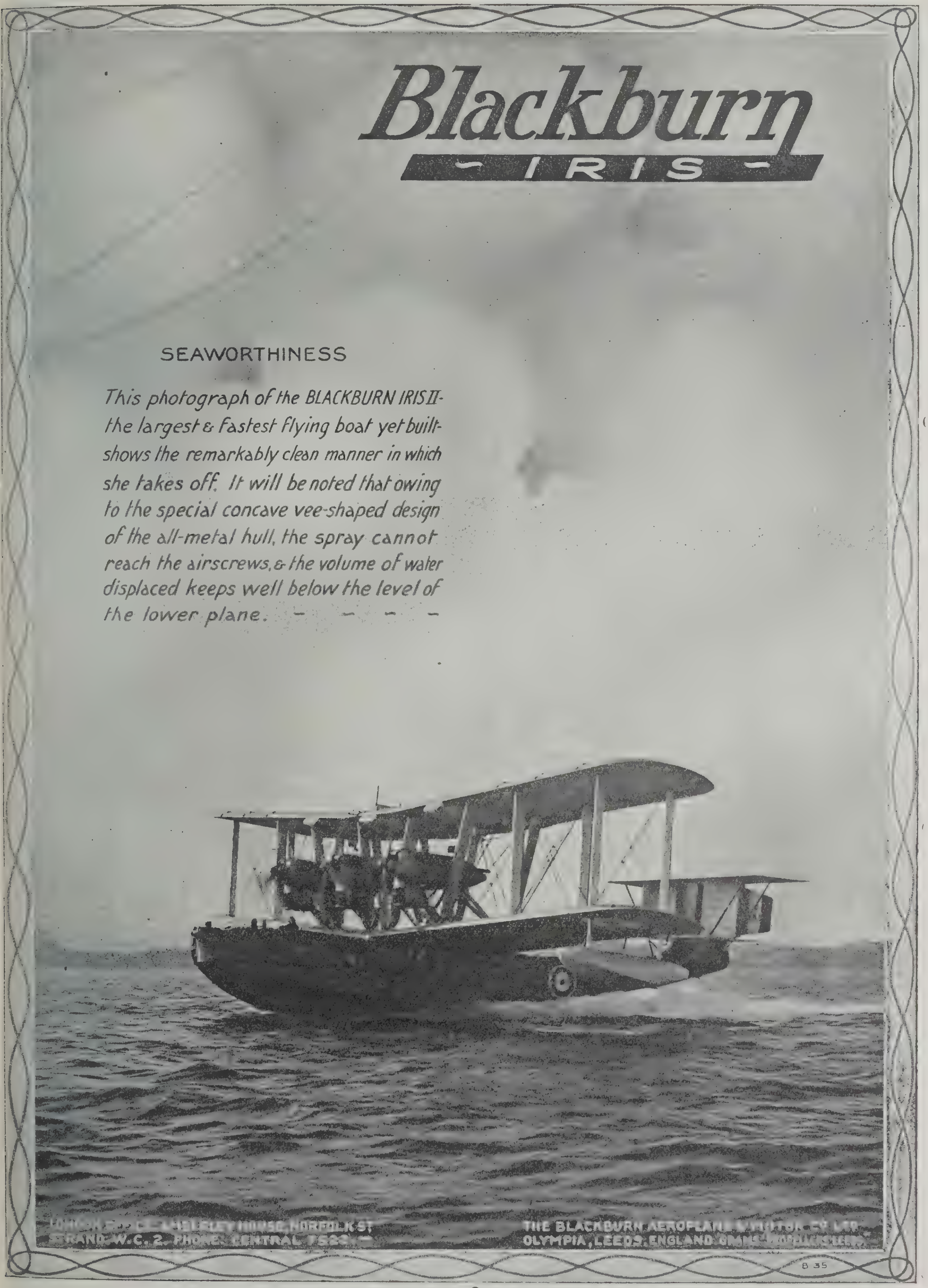
A Seaplane Base Re-union.

A re-union dinner of the R.N. Seaplane Bases, Port Said and Alexandria, Egypt, Old Comrades' Association (including H.M.S. *Ben-my-Chree, Raven, Anne, Empress* and *City of Oxford*), will be held at the Chantecler Restaurant on Jan. 28 at 6.15 p.m. Tickets, 4s. 6d. each, may be had from Norman M. Williams, 16, Shrewsbury Avenue, S.W.14.

A BRITISH WORLD'S RECORD.

The F.A.I. has officially recognised as a World's Speed Record the fourth and fifth laps flown by Flt. Lt. S. N. Webster, A.F.C., R.A.F., on the Supermarine S.5 (Napier Lion engine) in the Schneider Trophy Race on Sept. 26, 1927. The speed over these two laps, which represent 100 kms., was 456.522 km.p.h. (284.314 m.p.h.).

The previous record was held by Major Mario de Bernardi, who made a speed of 399.423 km.p.h. (248.041 m.p.h.) during the 1926 Schneider Trophy Race at Hampton Roads, Va., on Nov. 13, 1926.



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B 35

AN INDIAN TRANSPORT COMPANY.

In THE AEROPLANE for Dec. 21, 1927, it was announced that a company, known as the Eastern Commercial Co. of Nanjee Buildings, Elphinstone Circle, Bombay, was negotiating for the purchase of 24 aeroplanes with the E. M. Laird Co., of Wichita, Kansas, U.S.A.

It has since been announced that the U.S. Aeronautical Chamber of Commerce has been advised by the above-named company that in the near future it will require the services of about twenty pilots and navigators and about ten experienced mechanics holding licences of the U.S. Department of Commerce.

Through the courtesy of a correspondent in Bombay one has now received a prospectus and programme of operations of a company to be known as Eastern Airways, which is in process of formation as an offshoot of the above-mentioned Eastern Commercial Co.

Eastern Airways is being formed with the object of opening up air services between different centres—and as a beginning the prospectus announces that "the Company proposes to commence with a *modest* attempt to establish air services between the following places:—Bombay—Karachi, Calcutta—Rangoon, Rawalpindi—Srinagar (Kashmir), and Siliguri—Darjeeling."

For the purposes of providing for joy-flying and short-distance taxi-trips, it also proposes to establish five central stations at the following places:—Bombay, Calcutta, Delhi, Rangoon and Madras.

According to the prospectus, "to begin with" it is proposed to purchase forty-three aeroplanes, consisting of six D.H.61's, 16 D.H.50's 16 D.H.9's, and five D.H. Moths, but according to the programme of operations, instead of D.H.61's, six three-engined monoplanes are mentioned.

After showing in some considerable detail a summary of an imaginary year's working, the prospectus says:—"The statement of the annual expenditure and cost of running the above machines as well as the approximate income from the various services has been prepared by the Company's technical adviser from which it will readily be seen that the company would be able to declare a dividend of not less than 25 per cent. per annum in the very first year after setting aside a decent sum for depreciation, reserve and other necessary funds, and also providing for insurance.

In case the above dividend is not considered sufficient a further paragraph announces that:—"The above figures do not include any revenue from the carrying of postal mails, goods, or premiums from pupils under instruction, which is also expected to enhance profits, as expenses, in this direction have been included in the above estimates."

All this, together with the rest of the information supplied, shows that the proposed company has distinct ambitions, but unfortunately it also appears to have little imagination.

Eastern Airways is being promoted by one Englishman and on Indian, but so far they have been unable to induce anyone to serve on the Board of Directors, and until this is done the company cannot be registered. This would tend to show that the Bombay business-man, even if he knows nothing about air-transport, does know something about company promotion.

The above information should settle any qualms that may be aroused by the announcement that the company may require personnel holding U.S. Department of Commerce licences.

THE SCHNEIDER TROPHY RACE.

An Extraordinary Conference of the Fédération Aéronautique Internationale was held in Paris on Jan. 5 and was presided over by the Comte Henri de la Vaulx. This conference was called at the instance of the Royal Aero Club to consider the Schneider Trophy Rules.

The proposals of the Royal Aero Club, that the Schneider Trophy Race should, in future, be run every two years and that the next race should take place in 1929, were unanimously agreed to.

As Article 1 of the rules which govern the conditions under which the race should be run contained no ruling as to the intervals which separate each contest it was decided to make the following modification in the existing rules: "The winner to be the country which shall have gained three victories out of five successive contests; these contests to be held every two years."

FAIRCHILD AIRCRAFT IN CANADA.

Canadian Vickers Ltd., of Montreal, P.Q., has obtained from the Fairchild Airplane Manufacturing Corporation, of Farmingdale, L.I., N.Y., the licence to construct the Fairchild cabin monoplane in Canada.

This company has already obtained an order from the Canadian Department of National Defence for six monoplanes and in order that these machines can be supplied without delay all material for them is being supplied by the Fairchild Company.

THE LATEST DORNIER SUPERWAL.

The latest production of the Dornier Metallbauten G.m.b.H. of Friedrichshafen, a four-engined Superwal, has recently completed its trial tests.

This machine in general arrangement and construction is similar to the original Superwal except for the substitution of four 480 h.p. geared Gnôme-Rhône Jupiter engines, mounted in tandem pairs in two nacelles, in place of the two Rolls-Royce Condors which were carried in a single nacelle directly over the hull.

The hull has accommodation for twenty passengers, twelve in a forward compartment and eight aft. The crew consists of two pilots, one mechanic and one wireless operator.

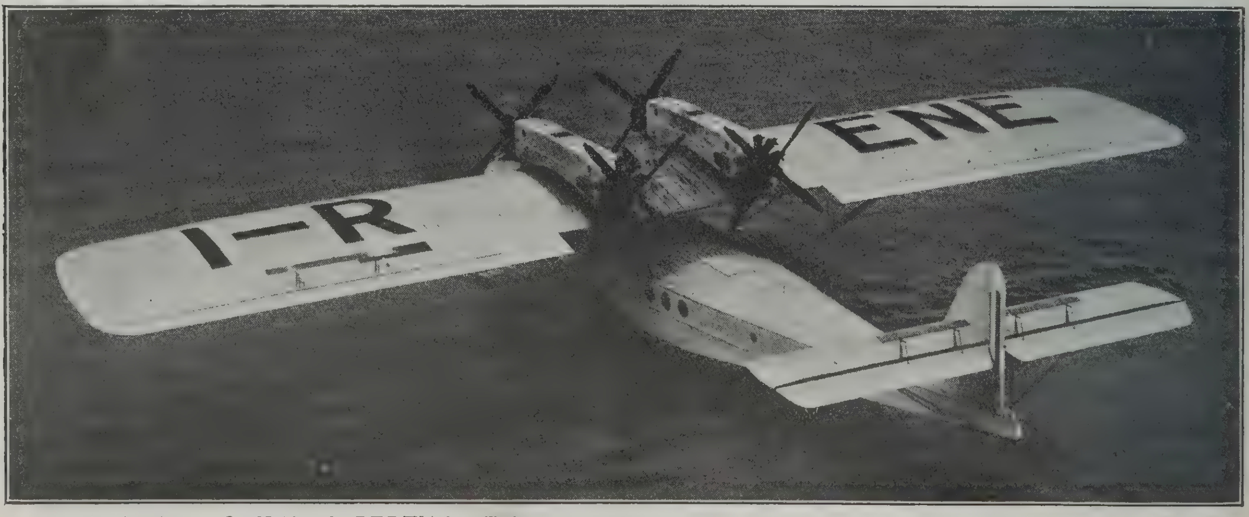
The wings are built up of two drawn sheet steel spars and duralumin box spars, the centre portion between the spars being covered with duralumin on the well-known Dornier principle. The leading-edge forward of the front spar and the trailing-edge aft of the rear spar, are detachable, the former being covered with smooth duralumin sheet and the latter with fabric.

The two engine nacelles are mounted directly to the wing on either side of the hull, and a covered ladder from the interior of the hull to the centre-section between the nacelles renders all four engines easily accessible.

Petrol is carried in eight tanks, four of 300 litres and four of 600 litres capacity, making a total of 3,600 litres (792 gallons).

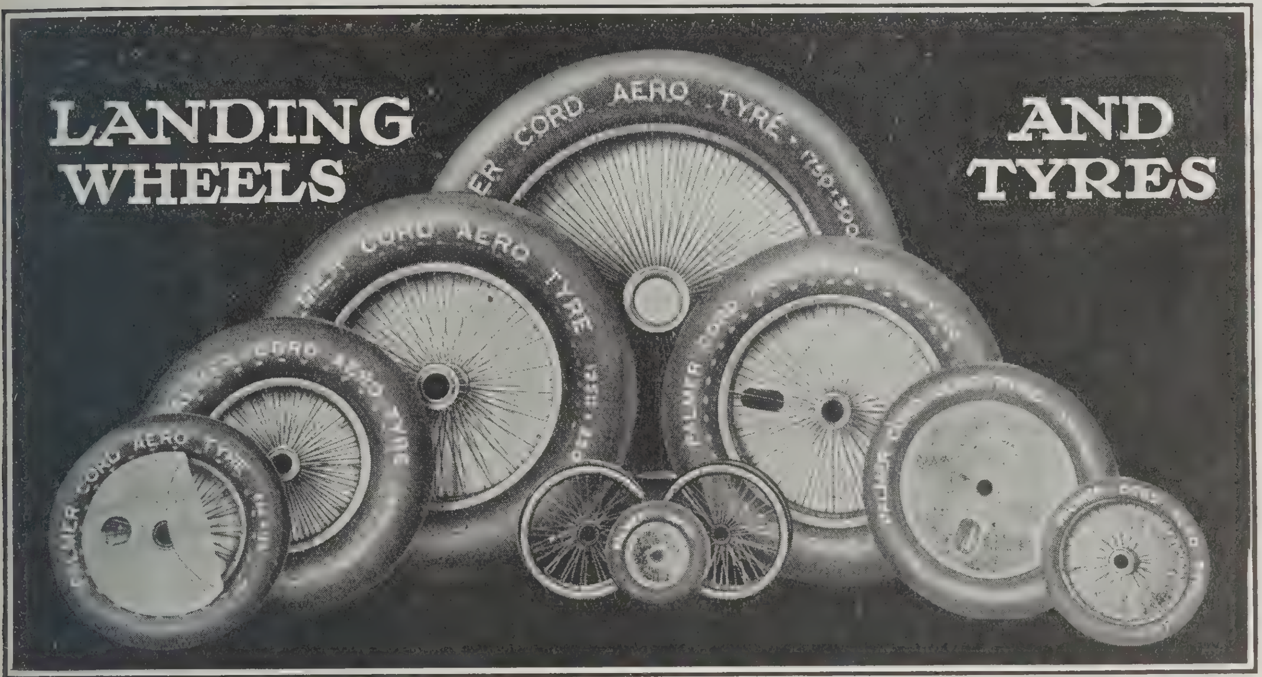
The overall dimensions of the boat are as follows: Span, 28.6 m. (93 ft. 9 ins.); Length, 24.6 m. (80 ft. 8 ins.); Height, 5.9 m. (19 ft. 4 ins.); Wing area, 143 sq. m. (1,538.6 sq. ft.).

A top speed of 220 km.p.h. (136.6 m.p.h.) was reached on trials.



THE LATEST DORNIER SUPERWAL.—This view shows the arrangement of the four 480 h.p. Gnôme-Rhône Jupiter engines which have replaced the two tandem engines mounted directly over the hull.

PALMER



STANDARD SIZES.

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
"	172	130.	38.09	Central
575×60	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
600×75	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
700×100	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
650×125	119	178.	55.	132/46
"	147	178.	55.	Central
"	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
"	162*	185.	55.	Central
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	177	185.	55.	135/50
"	183	185.	55.	Central
"	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
"	174	250.	80.	Central
"	182	185.	55.	Central
"	187	220.	66.67	Central
"	201	185.	60.32	125/60
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900×200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	157	185.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
975×225	192	185.	60.32	Central
"	194	185.	55.	125/60
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
"	191	350.	150.3	Central
1750×350	193	400.	125.	Central

**Wheels Nos. 161, 162, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres.* *†Wheel No. 169 is fitted with Ball Bearings.*
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AIRSHIP ROUTES IN THE DOMINIONS.

The mission—consisting of Group Captain P. F. M. Fellowes (Director of Airship Development), Mr. M. A. Giblett (Meteorological Office), and Flt. Lt. S. Nixon (Royal Airship Works, Cardington)—which has been touring the British Dominions to survey possible Imperial routes for airships, has now returned to this country, apparently well pleased with its reception overseas.

According to *The Times,* the mission found that a vivid interest in the possibilities of airship transport was displayed by the business communities throughout the Dominions, and the results of their survey have been to establish a system of main and intermediate airship bases covering the chief commercial routes of the future.

Each Dominion Government has now been provided with full information as to the necessary provisions and equipment for airship communications, and a choice of sites for bases in South Africa, Australia, Tasmania, New Zealand, Ceylon, and India, has been made. Intermediate bases on the East and West Coasts of Africa and in the Cocos Islands have also been prospected

A considerable addition has been made to the knowledge of meteorological conditions over the routes surveyed, and the Dominion authorities have been fully informed as to the meteorological and wireless services which will be needed.

The realisation of the proposed network of Imperial airship services must await the completion of extensive tests on the new airships, and the carrying out of a series of demonstration flights. In the preliminary stages economy of expenditure on bases will be necessary, and the first demonstration flights will probably be made between Britain and India, Britain and Canada, and Britain and South Africa, as these will only require one base in each of the Dominions

Following the success of these demonstrations more ambitious flights—as to Australia and New Zealand and back—will be attempted as soon as the necessary route equipment is provided.

AVIATION IN RHODESIA.

A company, to be known as the Rhodesian Aviation Co. Ltd., is being formed in Bulawayo to take over the existing Rhodesian Aviation Syndicate and to extend its activities to cover every form of aeronautical activity.

The Rhodesian Aviation Syndicate, which has been operating in Bulawayo for several months, has one D.H.6 (80 h.p. Renault engine) which originally belonged to Capt. J. Douglas Mail, A.F.C., who is now the pilot of the syndicate. One 1928 D.H. Moth X (30-80 h.p. Cirrus engine) is on order and has been shipped to Durban, whence it will be flown to Bulawayo, and in addition the Rhodesian Aviation Syndicate holds the sole agency for the D.H. Moth in Northern and Southern Rhodesia.

The Rhodesian Aviation Co. proposes to open an aviation school and also to establish a Light Aeroplane Club in Bulawayo. The Rhodesian Government has been approached to assist the company with an original grant and annual subsidy.

COLONEL LINDBERGH'S TOUR.

On Jan. 3, Col. Lindbergh, who is making a tour of Central America on the "Spirit of St. Louis," left San Salvador at 11.45 hours, and flew to Tegucigalpa, Honduras, where he landed at 14.55 hours.

A FOKKER BOMBER.

The Atlantic Aircraft Corporation, of Hasbrouck Heights, N.J., has produced a twin-engined bomber which, except for having two instead of three engines and a differently-arranged fuselage, is similar in general arrangement and construction to the standard FVII-3m.

This machine is known as the XLB-2 and is fitted with two 425 h.p. Pratt and Whitney Wasp engines.

In the nose of the fuselage is the front gunner's cockpit over which is mounted a Scarff ring with twin Lewis guns. Under this cockpit and slightly to the rear is the bomber's compartment which is surrounded by non-splinterable glass windows. Slightly to the rear again, but above the bomber's compartment, is the pilot's cockpit with accommodation for two side-by-side.

The controls consist of a single central lever fitted with an elbow so that the control wheel may be swung in front of either seat, and two rudder bars either of which can be slid out of the way when not in use.

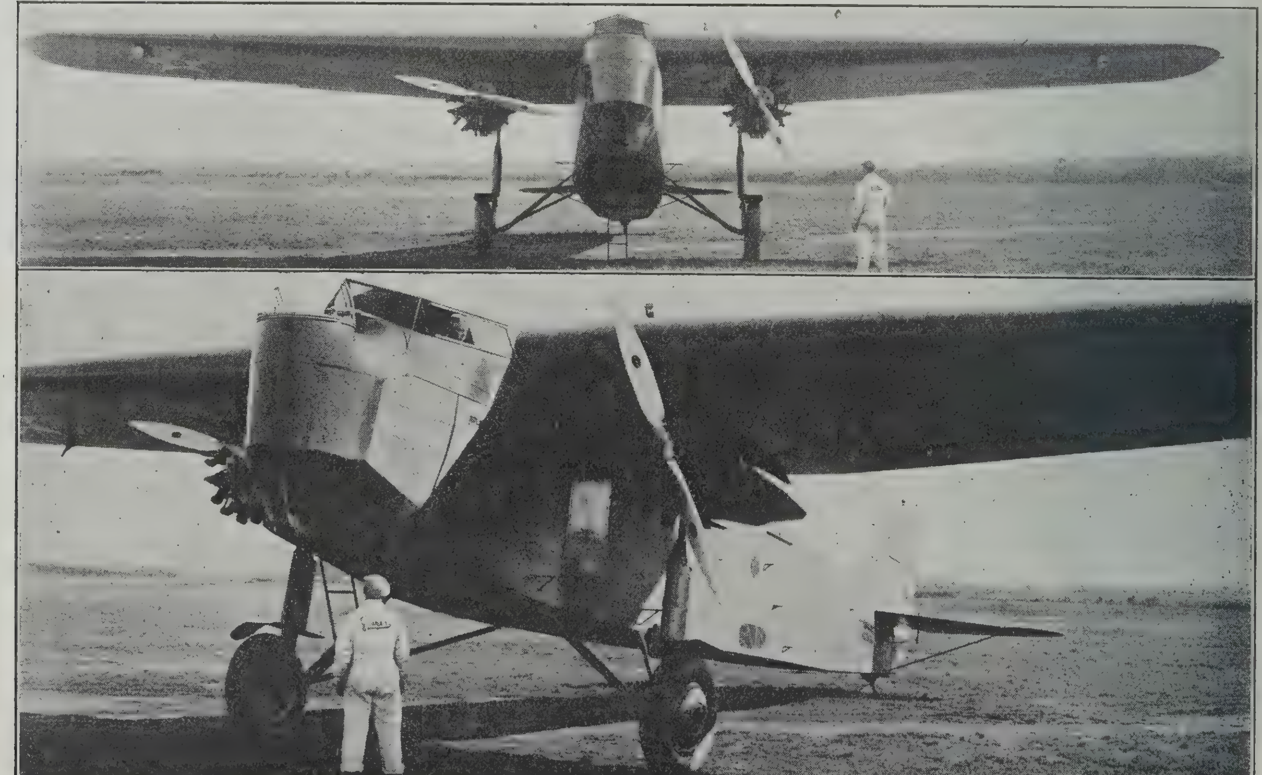
Behind the pilot's cockpit and under the wing is the internal bomb compartment.

Behind this compartment is a two-storey cockpit, the top one of which is occupied by the back gunner who is provided with two Lewis guns on a Scarff mounting. Below is a single gun mounting arranged to permit firing under the tail. This compartment is also fitted with wireless and provision is made for the installation of photographic equipment.

Structurally the XLB-2 follows conventional Fokker practice, with welded steel-tube fuselage and wooden cantilever wing.

The undercarriage is of the F-VII type, but has oleo mechanism in addition to the usual Fokker rubber ring suspension. Hand-operated wheel brakes are fitted.

No performance details are available, but the following are the principal overall dimensions: Span, 73 ft. (22.26 m.); Length, 51 ft. 4 ins. (15.64 m.); wing area, 748 sq. ft. (69.56 sq. m.); Weight loaded, 12,000 lbs. (5,448 kgs.).



A FOKKER BOMBER.—The Fokker XLB-2 (two 425 h.p. Pratt and Whitney Wasp engines) which is at present undergoing tests for the U.S. Army Air Corps.

After extended competitive trials the WESTLAND WAPITI has been chosen by the Royal Air Force as a General Purpose Aircraft.
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TOWARDS AUSTRALIA.

On Jan. 5 Mr. W. N. Lancaster and Mrs. Keith Miller, who are attempting to fly to Australia on the Avro Avian "Red Rose" (A.D.C. Cirrus II engine), arrived at Taiping, from Tavoy and Victoria Point. It was on this flight that according to the daily press Mrs. Miller fought and killed an adventurous snake with the spare control lever.

On Jan. 8 they arrived at Singapore.

On Jan. 9 they left Singapore for Muntok, where they arrived at 11.30 hours.

On Jan. 10 they took off for Batavia at 07.00 hours but soon after taking off they were forced to return and in attempting a forced landing crashed.

Mr. Lancaster had his lower lip cut and suffered slight concussion, and Mrs. Miller has a broken nose. The machine is badly damaged, but it is not yet known if the damage is repairable.

The accident is extremely unfortunate. So far the crew of the "Red Rose" have made a plucky attempt to overcome all sorts of difficulties and have put up a very creditable show.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

There has been no flying during the week ending Jan. 8.

The Lancashire Aero Club.

[Sec., Woodford Aerodrome, near Stockport.]

Report for period ending Jan. 7.

Flying Time 17 hr. 5 min. *Instruction* 4 hr 35 min. *Solo Flights* 9 hr. *Passenger Flights* 1 hr. 50 min. *Tests* 1 hr. 40 min. *Instruction.—With Mr. Brown*—Messrs. Heath, Chart, Hall, Meads, Browning, Gort, Miss Baerlein and Miss Brown. *With Mr. Cantrill*—Messrs. Davison and Browning. *With Mr. Scholes*—Mr. Benson. *Soloists (under instruction).*—Messrs. Heath, Browning and Caldecott, Ruddy and Browning. *Pilots.*—Messrs. Goodfellow, Twemlow, Lacayo, Hardy, Leeming, Meads, Michelson, Nelson, Gattrell, Rowley, Crosthwaite, Miss Brown. *Passengers.—With Mr. Cantrill*—Miss Boyes. *With Mr. Twemlow*—Messrs Allott and Hall. *With Mr. Goodfellow*—Mr. Mills. *With Mr. Leeming*—Messrs. Thompson, Moffat, Benson and Mathews.

Notes.—One owes an apology, does not one, for the absence of Club notes from Lancashire during the festive season. There are several explanations of an impeccable nature, all true, but as none of them would be believed, however plausible, one refrains from giving them.

Just before the Christmas holidays Lieut. Heath went solo and got through his tests, all in one week—a very creditable performance. Since the New Year, however, things have been going badly. Avian QL's engine having smashed a con-rod, her sister RR's engine went on sympathetic strike, a big end bearing disintegrating for no apparent reason except pure cussedness. Thereupon Mr. Crosthwaite, on our veteran Moth MQ, lost control when taxi-ing down wind over the frost-hardened ground and dived nose first into the pond. This reduced us to the Renault-Avro and even with the help of Moth LV, which we have taken back from Mr. Anderson temporarily to ease the situation, we are still in a bad way.

Incidentally MQ's crash produced the first injury of any note to the personnel of the Club. The pilot was quite all right, but Mr. Dobson, motoring out to the crash at speed, struck a ridge on the aerodrome with the result that Col. Nelson, who was with him, sustained a fracture of his classical nose and a generally bent face. Jolly hard luck.

No claim has been made on the B.A.I.G. under our expensiv personal accident policy!

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Jan. 7.

Flying Time 5 hr. 30 min. *Instruction* 2 hr. 40 min. *Soloists* 1 hr 30 min. *Passengers* 1 hr. 55 min. *Instruction.—With Mr. Beck*—Messrs. Humpheries, Bell, Jackson, Clayton, Miller, Ellison. *Sol Instruction.*—Messrs. Humpheries, Clayton. *"A" Pilots.*—Messr Thomson, Wood, Norway. *Passengers.—With Mr. Beck*—Messrs. Ellis Storey, Bamford. *With Mr. Wood*—Mr. Critchley.

Of course the weather this week has been beyond descriptio except on Tuesday, when we discarded leather coats and flying boot and basked in the sun "a la Lido."

Reg. at last! We have survived the months of damped enthusias and triumphed in the end. Reg. Humpheries has been dogged by th foulest of luck right through his training. If it was not bad weather there were no machines; if the machines were all right, we wer booked up; if we were not booked up, somebody wanted "I love tha girl" on the banjulele; and on these lines he has struggled throug and finally won.

Another event of interest that has taken place this week is th marriage of Mr. R. H. L. Brackenbury to Miss Springman. Mr Brackenbury has been an active member of the Club during our las season, and Miss Springman has been one of our keenest joy-riders We wish them both the greatest joy and hope that Mr. Brackenbury's connection with the Club has not been in vain as there is ever prospect of him acquiring a Honeymoon Express in the early Spring

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Jan. 7.

Flying times for this week are not available to the writer a the moment, so this opportunity will be taken of reviewing th progress of this Club during the year 1927.

The total flying time for the year was 692 hours; the highest numbe of hours for one week being 30, and the highest for one month 9 hours. In considering these figures, it must be remembered tha we have only two aeroplanes and of course at the times of engin overhauls, etc., we have had the use of one of these only.

Sixty members of this Club are now flying solo, 32 of whom hav been trained ab initio at this Club by Flt. Lt. Thomson. Our younges soloist is Mr. Hall, who was trained here and flew solo at the ag of 16. One pupil, Lt. Lambe, R.N., flew solo after 8 lessons, totallin 3 hours 20 minutes. This was an exceptional case, as our instructo usually stipulates that a pupil shall have six hours' dual before bein sent solo. One lady pupil, Miss Home, has been trained at this Clu and has made a number of successful solo flights

Touching wood, we are able to state that no pupil of Flt. Lt Thomson has met with any accident, either during training or o his solo flights, and there has been no accident to any member whic entailed the slightest injury.

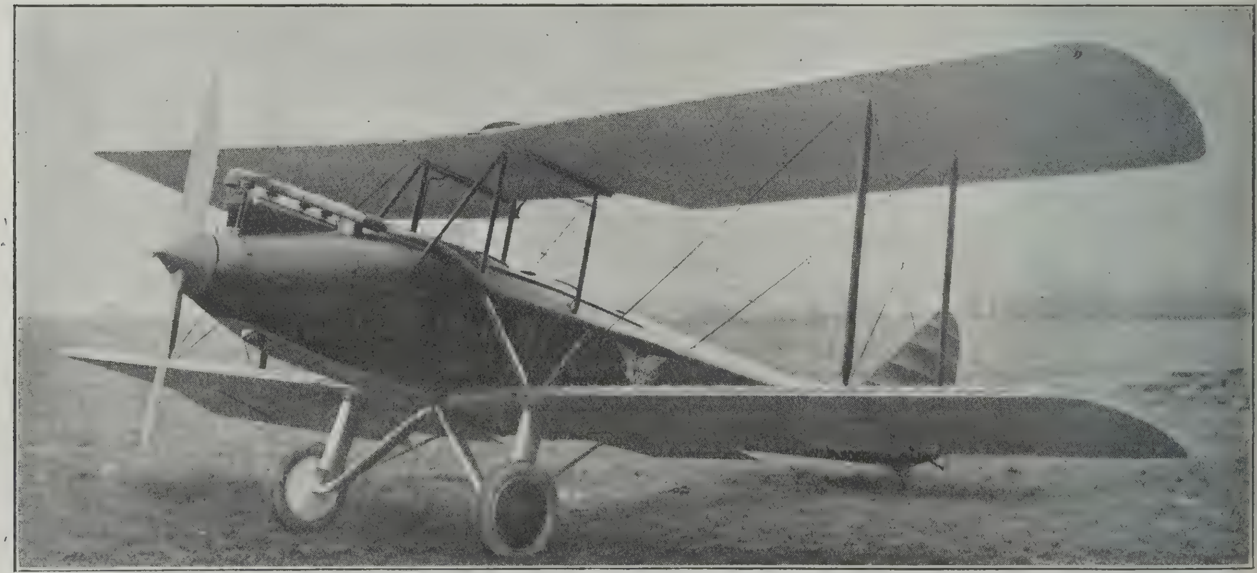
The social amenities of this Club have been improved beyond com parison, a fine Club-house now being available to the members and (this is of very great importance) a tremendous amount o experience has been gained, both in regard to the general runnin of the Club and the organisation of events such as pageants.

The Norfolk and Norwich Aero Club.

[Sec.: H O. Bennett, 5, Opie Street, Norwich.]

Report for week ending Jan. 8.

Total Flying Time 6 hr. 50 min. *Under Instruction.—With Mr Lines*—Messrs. G. F. Barker, R. F. Potter, N. Paul, G. F. Surtees N. Brett. *Soloists.*—Messrs. R. H. Harmer, W. P. Cubitt, R. W Moore, H. Pank, F. Gough. *Passengers.*—Mrs. F. Gough, Miss Boyce Mr. Boyce.



A SEAL-SPOTTING AVIAN.—An Avro Avian Mk. III (30/80 h.p. Cirrus engine) which has been purchased for use in seal-spotting in Newfoundland. Only departures from standard are the fitting of a cockpit heater operated from the exhaust pipe and an additional petrol tank to increase the range to 6-8 hours. Skis will be fitted and the machine is painted bright red to make it visible against snow and ice.

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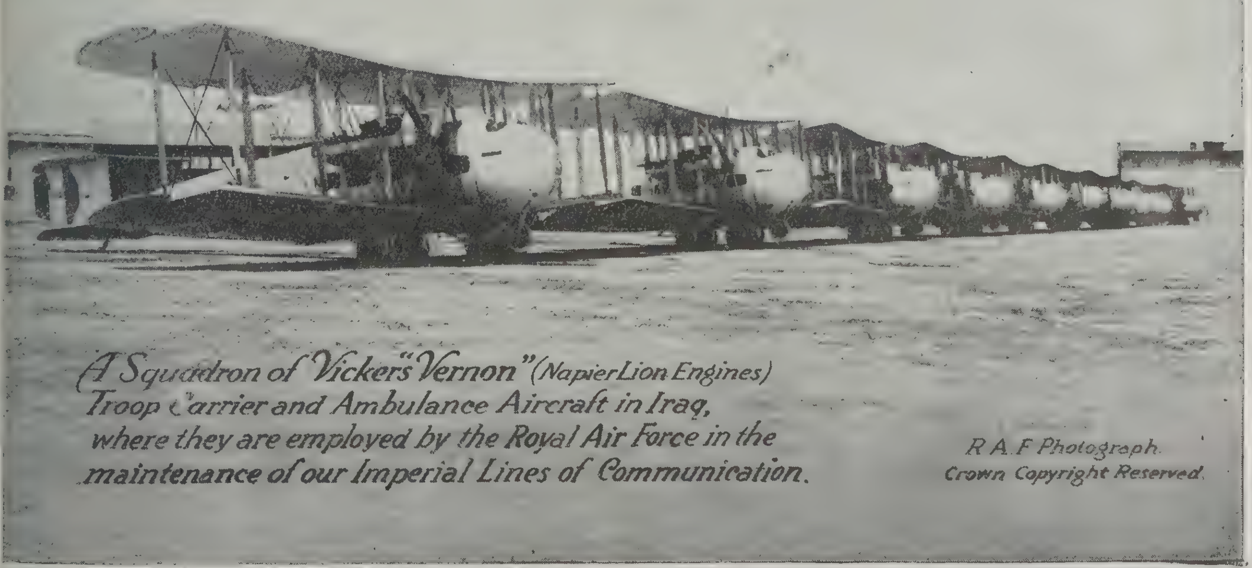


A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph. Crown Copyright Reserved.

Notes.—Very little to report this week; the Sunday flying was again our salvation. Mr. C. R. Bignold (ex-Lord Mayor of Norwich) has joined the Council, for which much thanks. The internal affairs of the Club are receiving attention with a view to efficiency and economy, the special committee's report has been received and is being dealt with; the recommendations are to the point and should prove extremely helpful to the Club and it is certainly reassuring. From it one gathers that there is no reason why an Aero Club should not be equally as well managed as any ordinary concern. The gaps which were so terrifying originally are now filled in by the subsidy.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Jan. 8.

Flying Time 4 hr. 10 min. *Instruction.—With Mr. Lowdell*—Miss Edwards, R. Brown, F. Jolly. *With Mr. Prentice*—K. Peck, F. Verney, S. Schofield. *Passenger.—With Mr. Prentice*—Miss D. Owles. *Soloists.*—Dr. Jas. Sleigh, S. Schofield.

Notes.—Sunday was the only day this week on which flying was possible, during the afternoon Dr. Sleigh successfully carried out his "A" licence tests in very fine style. Mr. Creasy, one of our first soloists, has now joined the R.A.F.; it is a great disappointment to the Club that he was unable to complete his "A" licence tests before leaving.

The Bristol and Wessex Aeroplane Club.

[Sec.: Col. G. Flemming, O.B.E., M.C., Filton Aerodrome, Bristol.]

Report for week ending Jan. 7.

Total Flying Time 2 hr. 5 min. *Instruction* 1 hr. 5 min. *Passenger* 1 hr.

The weather conditions this week are the worst the Club has experienced since its formation in July.

The Scottish Flying Club.

[Hon. Sec.: H. W. Smith, 101, Vincent Street, Glasgow.]

Report for December.

Total hours flown, 61 hr. 15 min. *Number of members under instruction,* 40. *Number of solo flights,* 11. *Total number of actual flights made,* 174. *Number of days when flying was possible,* 23.

The following members secured their "A" Licence:—Messrs. M. Barclay, B. R. Miller, A. Russell, George C. Walker.

The above figures show very conclusively how great was the need in this part of the World for a flying club, and applications for instruction continue to flow in every day.

The Club started its activities on Saturday, Dec. 3, when there was a general gathering of the members and their friends to the number of upwards of 300. The afternoon was dedicated to taking up those who desired to have a flip, for which a small charge was made, and in all some 68 flights were made during the afternoon, and a very satisfactory revenue accrued to the Club's funds from this effort.

On Dec. 4 the Club entered into serious duties, and from that day on one can say that the Moth has never looked back. The extraordinary enthusiasm which has been shown by members in spite of the somewhat inclement weather which was experienced in this part of the World has been gratifying indeed to the members of the Executive who were somewhat dubious as to the reception which the Club would have by starting in what must be probably one of the worst months of the year. However, the above figures give some idea of the enthusiasm shown by members and the strenuous work which is being put in by our worthy instructor, "Red 'ot Jones."

The Club Dance, which took place on Dec. 9, was a great success and there were 400 people taking part and a considerable sum was realised to augment the funds of the Club. It has been arranged that a further dance should take place at the Waldorf Palais de Danse on Feb. 10.

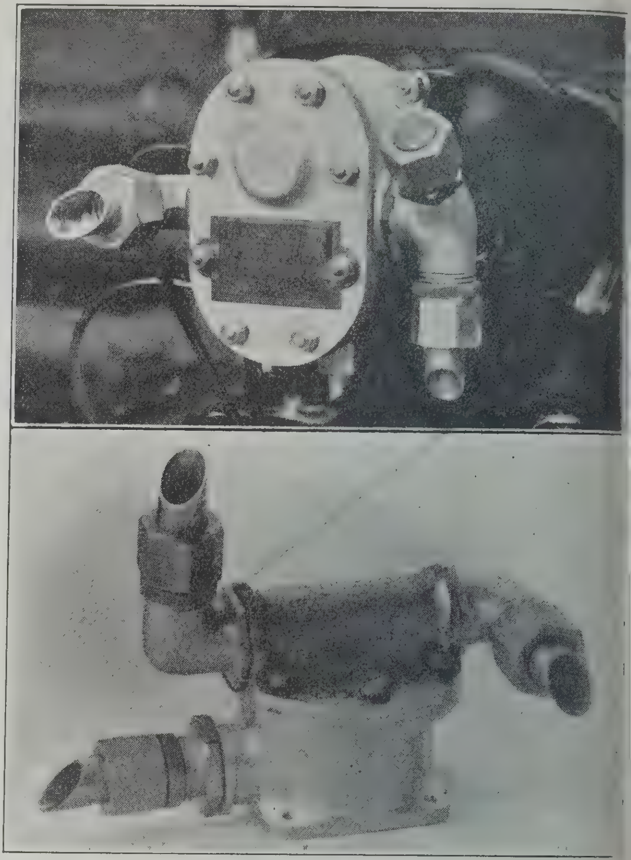
The Club-room at the aerodrome has been made fairly comfortable and members will be able to have tea during the week-end. Plans for the actual Club-house, which will include Men's Room, Ladies' Room, General Lounge and Bar, are well forward and should be in the hands of the Committee by the next meeting. It has been arranged that members of the Club will have an opportunity of meeting the Executive after the meeting on first Thursday of every month, when members will have the opportunity of putting before the Executive any suggestions which they may have to make. Efforts are being made to raise the necessary funds for the purchase of a second aeroplane and, following the valuable lead given by Messrs. Carlaw, who presented £150 to the Club, efforts are being made to stimulate the rest of the Motor Trade of the West of Scotland into putting up the necessary funds for the purchase of a "Motor Trade" aeroplane.

The design of the Club's Badge has now been fixed, and this is very attractive and exceedingly artistic. It is hoped that, in the course of the coming month, this will be issued to the members of the Club at a nominal charge to cover the cost. Steps are being taken to get a Club Tie and Blazer, and designs for these are being drawn up by one of the well-known outfitters in the town so that in another month or so the Club should have all these amenities ready.

A NAPIER ACCESSORY.

The ideal system for the supply of petrol to the carburetter of an aero-engine is a simple gravity system. Unfortunately it is often impossible, particularly in aircraft of high performance, to carry the whole fuel supply in tanks high enough above the carburetters to give a satisfactory gravity feed, and some method of pumping petrol either to an auxiliary tank which is high enough to give a gravity feed or direct to the carburetters must be adopted.

It has been usual in this country to use a windmill-driven petrol pump for these purposes. This type of pump has obvious disadvantages. The windmill is never very efficient, that is a good deal more power has to be used to drag it through the air than is turned to the useful purpose of pumping. And the consequent resistance remains practically constant, whether the engine is running all out and the pump is called upon for the maximum petrol delivery, or the engine is throttled right down during a glide.



The Napier engine-driven petrol pump (top) and petrol relief-valve (bottom).

An engine-driven pump on the other hand takes directly from the engine the power required to drive it, and this power will be in proportion to the engine's speed of rotation, and therefore more or less follows the required petrol delivery.

The reason why engine-driven pumps have been little used in this country is probably fear of fire risk. It is difficult to make a packing gland that will remain petrol-tight for long periods, and there are obvious dangers in putting a pump which may conceivably leak petrol inside the engine cowling if that can be avoided.

This difficulty of making a reliable leak-proof pump can be overcome, and D. Napier and Son, Ltd., have now produced such a pump which satisfies even the Air Ministry, and which has been fitted to a number of Series V Lion engines used on British Service aircraft with very satisfactory results.

The photograph here reproduced shows the pump in position on the rear end of the camshaft casing of the vertical cylinder block of a Lion V engine.

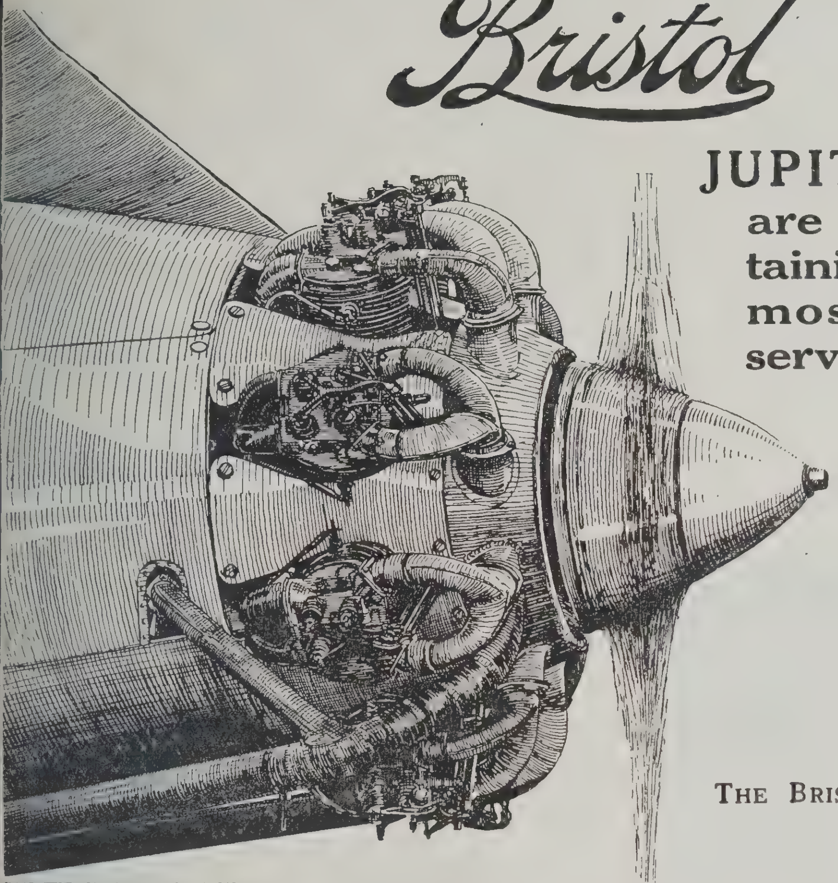
The pump is of the gear wheel type, driven through equal spur wheels from the inlet valve camshaft. The driven gear of the pump is of phosphor-bronze, the idler of steel, both contained in an aluminium casing. The gland for the driving shaft is packed with cork, and between the gland and the camshaft casing an oil-retaining groove and an oil-thrower ring are fitted to the shaft to prevent oil from the camshaft casing from reaching the gland.

A petrol relief valve which can be fitted in any convenient position is supplied for use with this pump, and this is also shown in the illustration.

The combine pump and relief valve permits of direct pump feed to the carburetter, all petrol delivered by the pump in excess of that required to maintain the fuel level in the carburetter being bye-passed through the relief valve back to the tank.

Obviously the same pump could be used to feed petrol to an auxiliary gravity tank in the usual manner.

The Napier engine-driven pump at the end of 100 hours' running gave a delivery rate of 40 gallons per hour at the equivalent of 700 r.p.m. of the engine, rising to 86 gallons per hour at the equivalent of 2,400 r.p.m. working against 23 ft. head of petrol on the suction side and 12 ft head on the delivery side.



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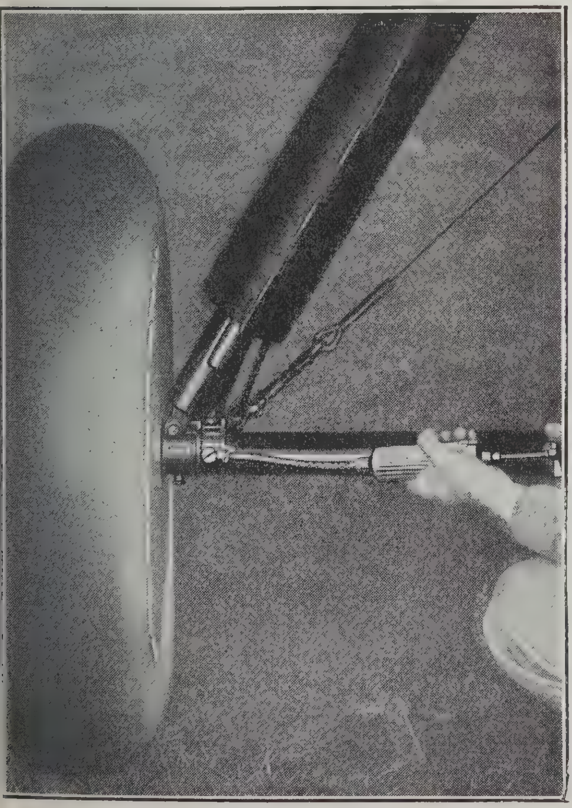
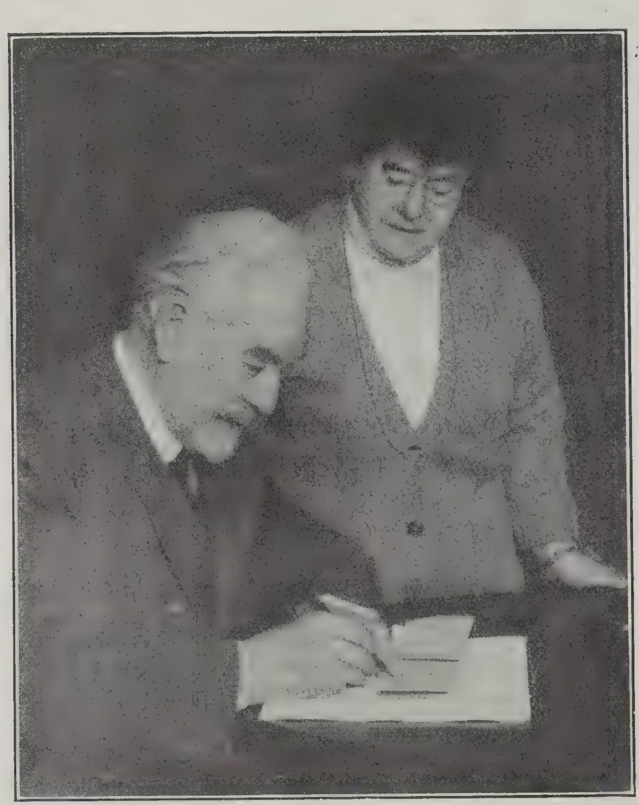


THE SAUNDERS GOLDEN WEDDING.

An event of a kind which is certainly unprecedented in the Aircraft industry took place at Cowes on Dec. 24, when Mr. and Mrs. S. E. Saunders celebrated their Golden Wedding. One hardly expects such a very juvenile industry as that concerned with aircraft to produce a member, even among its earliest pioneers, who could qualify for such an event, and certainly nobody who knows Mr. and Mrs. Saunders would suspect them of being old enough to have attained such a distinction. Mr. and Mrs. Saunders were, in fact, married at St. Peter's Church, Brighton, on Dec. 24, 1877.

The original Saunders business was started by Mr. Saunders's father on the Thames in 1830. There he built up the highest reputation as a constructor of Thames boats of all kinds. Mr. Sam Saunders began business on his own account nearly 55 years ago at Streatley-on-Thames. Thence he moved to Goring, and afterwards to South Stoke.

In 1901 he left the Thames and came to Cowes, where, as soon as internal combustion engines developed, he devoted himself to the construction of motor-boats. Very soon the Saunders hull and the Saunders method of construction made its place in history. For a period Mr. Saunders had a branch works at Kiel in Germany, building launches to demonstrate to the great Krupp firm the superiority of his method of construction. He was also commissioned to go with his staff to France to build racing boats for the Monte Carlo meeting, and the result was certainly the fastest boat of the year. Later he was commissioned by an Italian client and built a very successful boat at Genoa.



Mr. and Mrs. S. E. Saunders.

His first connection with aviation was in 1909, when he conceived the idea of a flying-boat. This led up to the building of the first genuine flying-boat in Europe in 1912—the Saunders-Sopwith "Bat-Boat." The hull was designed and constructed by S. E. Saunders Ltd., and the flying part of it by the Sopwith Works at Kingston. Not only was this a very successful flying-boat, but it was, in fact, the first successful amphibian. Soon after its completion it won the Mortimer-Singer Prize for making six consecutive flights off water on to land and off land on to water.

Thereafter several Bat-Boats were built which flew quite successfully, one of them, in fact, being bought by the German Government just before the War.

During this period at Cowes Mr. Saunders evolved the famous Consuta method of ply-wood, which has proved so successful in motor-boats.

Mr. Saunders's success as a flying-boat builder naturally indicated him as one of the immediate sources of supply of aircraft on the outbreak of war. Consequently, within only a few weeks of the outbreak of war, he had already embarked on a big programme for the production of aeroplanes for the War Office. At the same time he got going on the boatbuilding side and built during the War vast quantities of flying-boat hulls and seaplane floats, which were delivered to other aircraft firms for the fitting of the flying components. It is, one believes, true that the Saunders output of big flying-boat hulls was greater than that of any other firm in the country.

Since the War Mr. Saunders has made a number of extremely interesting experiments in aircraft design and construction. And the most recent of these, the Saunders Valkyrie, recently took part successfully in the R.A.F. flight from Felixstowe to the Baltic and back. Thus it may be seen that Mr. Saunders has done very valuable service to the Nation.

The celebrations at Cowes on Dec. 24 were worthy of the occasion. Everybody of importance in the Isle of Wight called on the happy pair. Among the first callers was a deputation headed by Sir George Shedden, D.L., J.P., C.A., and Canon Judkins, the rector of Cowes, who presented them with a handsome rose bowl, which was accompanied by a letter signed by Her Royal Highness Princess Beatrice, Lord Louis Mountbatten, Lieut.-Col. J. T. C. Moore-Brabazon, Viscountess Gort, Sir Warden Chilcott, Mr. S. F. Edge, Lord Montagu of Beaulieu, Major-General Seely, the Bishop of Winchester, the Bishop of Southampton, the Bishop of Portsmouth, Sir Francis McClean, Mr. C. R. Fairey, Mr. A. V. Roe, and many others. Handsome presentations were also made by the employees of the Saunders Works and other local concerns.

On this occasion one may recall the very handsome way in which Mr. Saunders made open house of his Works to everybody concerned with the ill-fated Schneider Trophy events in 1919 and 1923. One knows that should the next Schneider Trophy Contest be held on the Solent Mr. Saunders is anxious that again everybody should consider his works at their disposal.

As a purely personal note, one would like to add one's congratulations to the many that Mr. and Mrs. Saunders have received. One has known Mr. Saunders pretty well since those early days when he built the Bat-Boat. And one knows him to be the soul of hospitality, the essence of fine sportsmanship.

Like all men who made good, he has his own fixed ideas on certain subjects, and occasionally some of his ideas have been wrong. But every time one of his ideas has failed he has come up fresh and undefeated with something new which always had something interesting to recommend it. Since the War he must have spent many thousands of pounds of his own money on interesting experiments with aircraft. And it is well to record that a year ago he was quite ready to build a Schneider challenger and send it to America at his own expense.

We may well regard Mr. Saunders as the Grand Old Man of Aviation. We are all proud of him. Long may he flourish.—C. G. G.

A DURATION RECORD ATTEMPT.

On Dec. 18, Mr. Kingsford Smith, of Australia, and Mr. G. R. Pond (late U.S. Navy) took off from Mills Field, San Francisco, in the Fokker FVII-3m "Southern Cross" (three Whirlwind engines) in which they intend to try to fly across the Pacific, in their fourth attempt to beat the World's Duration Record. The machine took off with 1,442 gallons of petrol and 44 gallons of oil, but after flying for 10 hours they reported by wireless that their fuel consumption was heavy.

They were finally forced to land through lack of petrol after remaining in the air for 48 hours 27 mins., some four hours short of the World's Record.

THE WESTLAND AIRCRAFT SOCIETY.

The following programme of lectures has been arranged for the current session by the Westland Aircraft Society at Yeovil:—

Jan. 18.—"Modern Developments in Aircraft Instruments," by Major C. J. Stewart, O.B.E., M.I.M.E., F.R.Ae.S., M.I.A.E. At the Three Choughs Hotel

Jan. 25.—"Sir Henry Bessemer and his Work," by R. J. Norton, Esq., Director of Petters Limited. At the Mermaid Hotel.

Feb. 8.—"The Schneider Trophy Contest of 1927," by Flt. Lt. Webster, A.F.C., R.A.F.

Feb. 15.—"Drilling for Oil and the Production of Petrol," by St. John Plevins, Esq., Anglo-American Oil Co.

Feb. 23.—"Performance Testing of Aircraft," by H. L. Stevens, Esq., B.A., A.F.R.Ae.S.

Mar. 2.—"High Speed Aircraft," by F. Radcliffe, Esq., The Gloster Aircraft Co.

Mar. 7.—"Acetylene Welding," by H. H. Stoodley, Esq., British Oxygen Co.

Mar. 14.—"Inspection of Aircraft," by R. C. Taylor, Esq., A.F.R.Ae.S., Westland Works.

Mar. 21.—"Jupiter Aero-engines," by W. Jeffries, Esq., Bristol Aeroplane Co.

A film entitled, "The Age of Speed," will be shown during the session, and towards the end of March a Mock Ground Engineers' Examination will take place.

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The Short "Singapore" is the first all-metal Flying Boat designed by British Constructors, and represents developments following the production, by Messrs Short Brothers of Rochester, of a metal hull to the order of the Air Ministry, in 1924 Sir Alan Cobham is using this machine for his African survey tour It is fitted with twin Rolls "Condor" 111A water-cooled engines, each developing 700 H P at 2,000 R P M, and it can be flown with full load on one engine First flown in August, 1926, it has since undergone successful trials at the M A E E, Felixstowe

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How Aircraft Tubes are Made

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Before any operations are carried out, the "blooms"—as the tubes in the rough are called—have to pass a laboratory test to determine that the constituents are up to specification ; after that, they are "normalised"—*i.e.* subjected to a special heat treatment which counteracts any defects that have developed during the process of rolling Then they are marked with a number indicating their quality, for the purpose of identification as they are going through the mill

The next operation is to reduce one end of the bloom in a power forging hammer The tube, in the drawing operations which follow, is pulled through the die by means of the "tag" thus formed At the same time a small hole is punched in the tube at the point where the tag begins, to allow the acid and water to work through the tube in the subsequent pickling and washing operations

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 10; Tuesday, 5; Wednesday, 17; Thursday, 12; Friday, 13; Saturday, 9; Sunday, 3.

IMPERIAL AIRWAYS LTD. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne : Machines 26, passengers 156, freight 9 tons.
AIR UNION :
Paris—London : Machines 7, passengers 20, freight 10 tons.
K.L.M. :
Amsterdam—Rotterdam—London : Machines 11, passengers 14, freight 3 tons.
SABENA :
Brussels—London : Machines 5, passengers 1.
DEUTSCHE LUFTHANSA AG. :
Amsterdam—London : Machines 9, passengers 9.
PRIVATE :
Machines 0, passengers 0.

Total number of trips by British Machines, 26, carrying 156 passengers. Foreign Machines, 33, carrying 44 passengers.

COMPARATIVE FIGURES.

Week ending Jan. 8 :
Machines, 59; Passengers, 200; Crews, 104; Total personnel, 304.
Corresponding week, 1927 :
Machines, 41; Passengers, 131; Crews, 67; Total personnel, 198.
Corresponding week, 1926 :
Machines, 53; Passengers, 120; Crews, 65; Total personnel, 185.
Corresponding week, 1925 :
Machines, 63; Passengers, 70; Crews, 79; Total personnel, 149.
Corresponding week, 1924 :
Machines, 38; Passengers, 51; Crews, 58; Total personnel, 109.
Corresponding week, 1923 :
Machines, 34; Passengers, 63; Crews, 65; Total personnel, 128.
Corresponding week, 1922 :
Machines, 31; Passengers, 51; Crews, 50; Total personnel, 101.
Corresponding week, 1921 :
Machines, 27; Passengers, 30; Crews, 32; Total personnel, 62.

Croydon Notes.

The official date for the transference of operations from the old buildings to the new ones at the side of the Brighton by-pass road is now Jan. 30. And this time it seems quite likely that the forecast will prove more or less correct.

The final touches—such as the polishing of floors—are being put on the buildings. The wireless equipment for the new control tower is expected to be complete by about Jan. 15 thus giving a reasonable margin for tuning-up and discovering faults by the appointed date. And most important of all the work of installing telephones is now progressing.

The delay which has occurred in regard to telephones has been the one insuperable obstacle to any earlier occupation of the new buildings, and once that obstacle has been removed it will be possible to put some part of the new administrative buildings into use.

From the purely practical point of view the new control tower should be the most important improvement in the organisation of our Terminal Airport. The present tower is very cramped, is far from comfortable, and has to depend for many important communications with the outside world on written messages conveyed by hand.

The new control tower gives the duty officer a room 25 ft. square, glazed round the whole of its four sides with an absolutely unobstructed view in all directions.

Inside this room, in a special compartment, the wireless operator will have the whole of the control gear for both receiving and transmitting messages and for direction finding.

The route-traffic office is on the floor below the control room and a pneumatic tube between the two rooms will be used for the interchange of written messages.

Friday's gale—accompanied by an almost complete absence of visibility on the French coast—put a stop to all flying, but made a partial reparation by undertaking the demolition of one of the old Bessoneau hangar frames west of Plough Lane. Unfortunately it also blew in some of the windows of the new control tower. These have very large panes of unsupported glass, and it rather looks as though some reduction in the size of these panes would be advisable to avoid such accidents after the tower is in use.

How heavily Croydon was afflicted by the Christmas snowstorm is indicated by the fact that at the end of the past week there were still large piles of unmelted snow about, and there was a clean white drift about eighteen inches deep along the southern boundary edge on Friday.

Despite this the surface of the aerodrome has suffered very little from the effects of the thaw and has not been noticeably softer than it is usually at this season.

CROYDON'S NEW WIRELESS EQUIPMENT.

The wireless equipment which is to come into use at Croydon Aerodrome when operations are finally transferred to the new buildings on the eastern side of the landing ground has been designed in the light of seven years experience with the present equipment, and will, it is believed, prove a grea advance on the existing installation.

The new equipment will consist of a transmitting station on the southern edge of Mitcham Common some two and a half miles away from the aerodrome, but controlled from th aerodrome, and a receiving station at the aerodrome.

The transmitting station will contain four separate tran mitters of three kilowatts capacity each. These are able t operate on any wave length between 800 and 2,000 metre and on either telephone or telegraphic transmissio Normally one transmitter will work on the 900 metres fo telephonic transmission, another on the same wave lengt for Morse transmission, and a third will work at 1,400 metre The two 900-metre sets will be used for transmission to air craft, the 1,400-metre set for inter-aerodrome communication The fourth transmitter will be kept in reserve.

The aerial for the receiving station is mounted above th control tower at the aerodrome. It is of the Marconi-Bellini Tosi fixed type, and forms but a very small obstruction at th aerodrome. The actual receiving gear is in the tower im mediately below the aerial, together with the necessary char for the plotting of bearings obtained by directional methods

The receiving sets are of a very selective type, and arrange ments have been made whereby more than one receiver ca be operated simultaneously on different wave-lengths from th same aerial.

With this new equipment all wireless communications deal ing with air traffic can be handled directly from the contro tower. At present all messages on the 1,400-metre wave fron ground stations to Croydon are handled by the Air Ministr station and retransmitted to Croydon by the Post Offic telephone system, which leads necessarily to some delay, an introduces into the system one unnecessary and fallible link

The new installation will, it is hoped, be complete by abou Jan. 15, which will give a period of a fortnight for testin and tuning before the date fixed for putting the new contro tower into service.

IMPERIAL AIRWAYS SPECIAL CHARTER DEPARTMENT.

Apart from their regular services Imperial Airways hav always been ready to undertake special journeys for eithe business or pleasure purposes, and in a sporadic way a goo deal of business of this kind has come their way during th last few years.

In all cases where a machine is specially hired for a trip the charge made to the hirer naturally covers rather mor than the whole extra cost of running that trip, and for company like Imperial Airways which has in any case to mee the overhead charges of maintaining a fleet of aircraft in ser viceable condition, special charters of this kind represen profitable business.

Mr. G. P. Olley, who has been the pilot on a large numbe of special journeys of this type, therefore suggested to th management of the company that it was worth while to mak special efforts to obtain business of this class, instead o merely waiting for it to turn up.

He offered himself to set about finding such business, an Imperial Airways have accepted his suggestion. Mr. Olle therefore is now not only one of the firm's senior pilots, bu is also manager of a new Special Charter department of th firm.

THE FIRST CANADIAN AIR MAIL CONTRACT.

The Canadian Transcontinental Airways Ltd. of Quebec ha been awarded the first air mail contract by the Canadia Government. This contract is for a service between incoming and out-going Atlantic liners at the mouth of the St Lawrence River, and various Canadian cities, and calls fo all-the-year-round service.

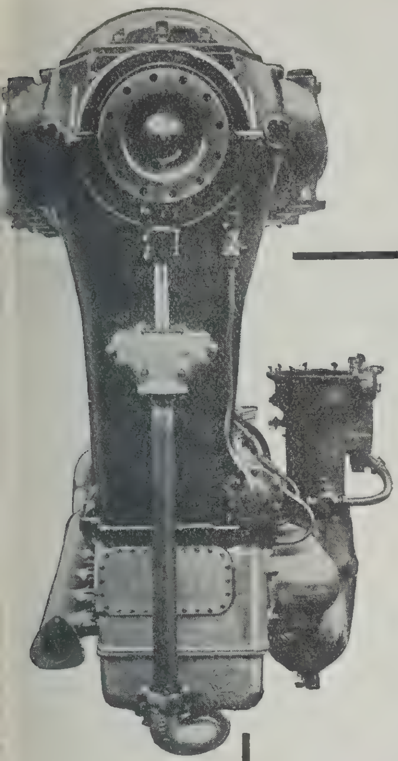
Machines to be used on this service will be Fairchild cabi monoplanes fitted with 425 h.p. Pratt and Whitney Wasp en gines and interchangeable floats and skis.

THE FEDERATION AERONAUTIQUE INTERNATIONALE.

The Committee of the Fédération Aéronautique Internationale was held in Paris on Jan. 5 under the presidenc of the Comte de la Vaulx. It was decided to award the Gol Medal of the F.A.I. to Colonel Charles Lindbergh for hi non-stop flight from New York to Paris.

It was decided to create a light seaplane class eligible fo World's Records, and it was agreed that the following categories should be introduced :—1st Category : Two-seat sea planes—weight empty to be not more than 500 kgs. (1,10 lbs.) ; 2nd Category : Single-seat seaplanes—weight empty t be not more than 250 kgs. (550 lbs.) ; 3rd Category : Single-seat seaplanes—weight empty from above 250 kgs. (550 lbs.) to 437½ kgs. (962.5 lbs.), inclusive.

The date for the next Gordon Bennett Balloon Contest t be held at Detroit, Ohio, was fixed for June 30, 1928.



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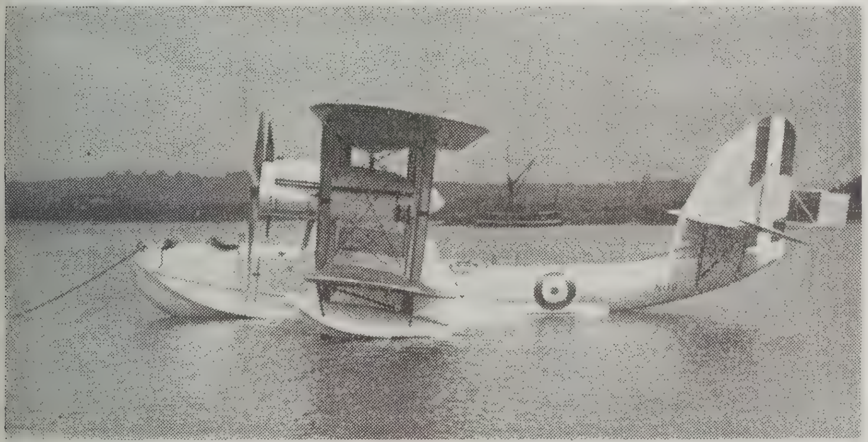

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"Condors"
Cellon Dope

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WHEN Cellon Dope was first introduced sixteen years ago Messrs. Short Bros. were one of the earliest users. Many changes have taken place since then in Aircraft Construction and the manufacture of Dopes has been correspondingly improved to suit the varied weather and temperature conditions met with in modern long distance flights. Cellon Dope is equal to every strain and meets all requirements.

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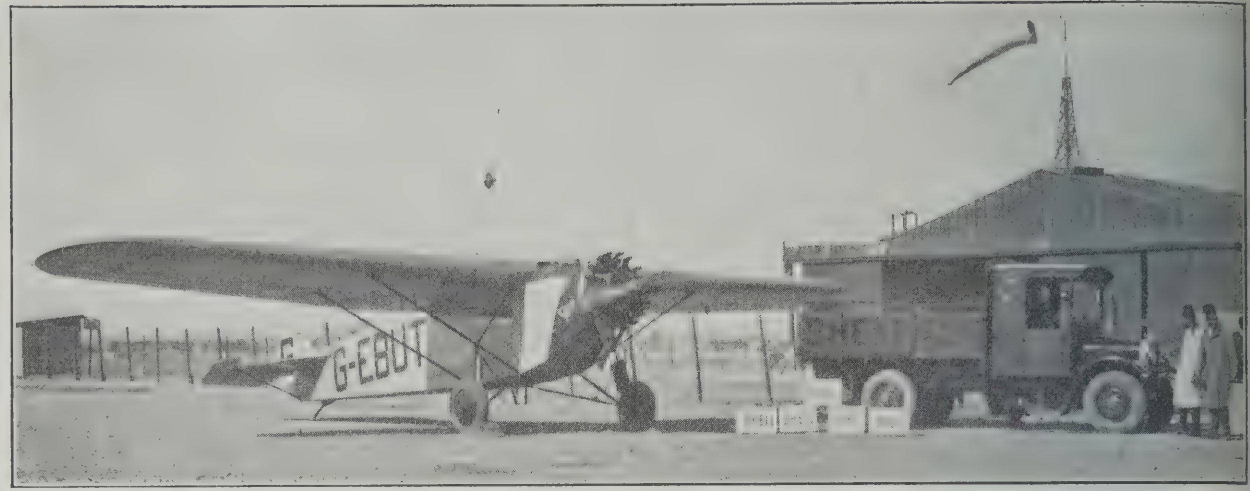

THE RIGHT SPIRIT. The Fokker Universal (200 h.p. Wright Whirlwind engine) on which Lord Carbery flew from Cairo to Nairobi, a distance of 2,650 miles in three days, filling up with petrol and oil at Cairo.

ETHYL'S ARRIVAL.

The advertisements which have appeared during the past week or two in the daily Press announcing the coming of Ethyl, can scarcely have puzzled those who are concerned with aeronautical affairs, and who have known for a long time that petrol doped with tetra-ethyl-lead has been supplied by the Anglo-American Oil Company for racing motor-cars and for use in high-compression aircraft engines.

By the time that this note appears in print Pratts Ethyl petrol will be on sale to the general motoring public at a price twopence per gallon higher than that of Pratts Perfection spirit.

The object of adding tetra-ethyl-lead to petrol is to prevent or delay detonation—in other words " pinking." It may be asked why supply this special doped fuel to the ordinary car-owner when his car will already work quite satisfactorily and without noticeable detonation on straight fuel.

The answer is that slight detonation—sometimes almost imperceptible, sometimes quite noticeable—will occur on any car engine on straight petrol if the engine is allowed to drop its speed sufficiently with full throttle and fully-advanced ignition. The limit to slow running of the average engine under load is usually detonation—shown by uneven pulling, and the use of ethyl fuel does in fact permit any given engine to run smoothly and sweetly under given conditions of load and speed with less retardation of ignition.

Some time ago one was provided with a few gallons of Pratts ethyl doped spirit for trial on the road. The engine in which it was used was in the ordinary way one which pinked only if grossly abused. It could not be made to "pink" at all with the new fuel, and it could be driven on top gear without signs of snatching at much lower speeds than was ordinarily possible.

With some of the more modern high-speed high-compression engines a very marked increase in the flexibility of the engine should result from the use of the new fuel.

WHITE SPIRIT.

A good many rumours have been floating about recently concerning a new safety fuel—which has even been described as non-inflammable—for aircraft engines, which has been used on a fairly extended scale by Air Union.

These rumours have a basis in fact. Air Union are using a fuel known as White Spirit. Very little reliable and detailed information as to the constitution of this new fuel can be obtained, but it can be said with fair certainty that White Spirit is a fuel akin to petrol and like petrol distilled—or possibly in part " cracked " from crude mineral oil.

It differs from petrol in having a higher temperature of distillation. That is it is intermediate between petrol and kerosene. It is less volatile and has a considerably higher flash-point than ordinary petrol, and consequently is not so likely to give rise, at ordinary temperature, to inflammable vapour.

Representatives of British producers of fuel have been taking a keen interest in White Spirit, and there is no reason to suppose that if it proves to have any real advantages a precisely similar fuel will not be available over here.

SATISFACTION.

Steel Wing Company Ltd.—Satisfaction in full on Nov. 4, 1927, of debenture dated Aug. 18, 1926, securing all sums not exceeding £18,000.

PERSONAL NOTICES.

Deaths.

BETHELL.—ON Dec. 24, at Beaulieu, France, Eustace Cyril Bethell, late R.A.F. and R.F.C., only son of Major Eustace Vincent Bethell, late R.F.A.

FISHER.—On Jan. 9, at Hinaidi, 'Iraq, as the result of a flying accident, Lionel Edward Ruggles Fisher, M.C., Plt. Off., R.A.F.

Mr. Fisher served in the Cavalry during the War, 1914-18, and was awarded the Military Cross. He was appointed to a commission in the R.A.F. in May, 1926, from the Regular Army Reserve of Officers and after a course of flying instruction at No. 1 F.T.S., Netheravon, he was posted to No. 6 Squadron, Mosul.

JAMES.—On Jan. 2, Betty, the only child of Flt. Lt. and Mrs. W. E. James, aged 11 years.

WHITTAKER.—On Dec. 12, at Bombay, Sq. Ldr. John Tudor Whittaker, M.C., R.A.F.

Sq. Ldr. Whittaker transferred from the A.S.C. to the R.F.C. during the War. He served with distinction throughout the War and was awarded the Military Cross in 1916 for distinguished service in the Field. After the Armistice he was appointed to the Aeronautical Commission of Control in January. In March, 1922, he went to India and joined No. 28 (Army Co-operation) Squadron. He was invalided home in June, 1922, and appointed to command No. 12 Wing in Ireland. In February, 1923, he was appointed to command No. 30 (Bombing) Squadron, Spittlegate. In September, 1927, he returned to India to command No. 28 (Army Co-operation) Squadron at Ambala

Marriage.

HOLMES—SQUIRE.—On Dec. 12, at Barnstaple Parish Church, John Duncan Vernon Holmes (late 19 Sqdn., R.F.C.), of East Hannay, Berks, to Florence Rowtcliff Squire, of Trafalgar Lawn, Barnstaple, Devon.

Forthcoming Marriage.

DEANE—SMITH.—An engagement is announced, and the marriage will take place very quietly at the end of January, between Flt. Lt W. W. Deane, R.A.F., and Flora Douglas, second daughter of Major and Mrs. J. W. Smith, Weyhill.

Births.

McKINLEY-HAY.—On Dec. 19, at Milton Road Nursing Home, Bedford, to Nina Mary, wife of Flg Off. E. A. McKinley-Hay, R.A.F.—a daughter.

MOYES.—On Jan. 6, at 5, York Terrace, Regent's Park, N.W.1, to Vera, wife of Eustace Moyes (late R.N.A.S. and R.A.F.)—a daughter

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THE AEROPLANE—JAN. 18, 1928.

Flying Boat Development.

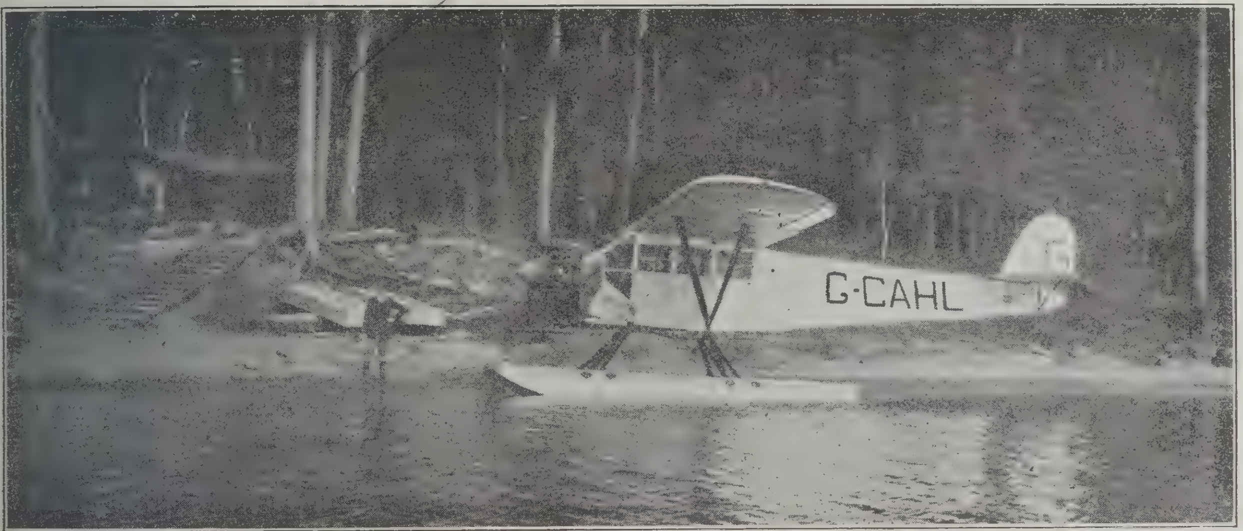
THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 3. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

THE EYES OF A STATE.



SURVEY IN THE FOREST:—A Fairchild cabin-monoplane (220 h.p. Wright Whirlwind engine) belonging to the Fairchild Aerial Surveys Co. (of Canada), Ltd., on a Canadian Lake. Several of these are in use by the above company and by the Canadian Government for aerial survey and light transport.

The Schneider Cup

THE EPICS OF 1927 achieved using K·L·G PLUGS

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Take, for example, the split axle undercarriage with its wide track, exceptional strength and great resilience, designed to ensure safer landings.

Or the automatic backward movement of the wheels when the wings are folded, lowering the nose of the machine so that the engine is brought down to a comfortable height from the ground for the purposes of adjustment or attention.

Or again the perfectly finished cockpits upholstered in leather with ample room and protection. Note the luggage compartment behind the pilot's seat, large enough to hold two full sized suit cases, also providing accommodation for a tyre pump, spare tyre and inner tube, engine, propeller and cockpit covers, etc., and even room for a spare propeller.

There are many other points which illustrate the thoroughness which the designer of the "Avian" kept to the front. These are dealt with in a leaflet which will be sent free to those interested.

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Works : Hamble, Southampton.

JAN. 18, 1928.

THE AEROPLANE

Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 3.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON THE DEVELOPMENT OF FLYING-BOATS.

The extraordinarily fine show which has been put up by the Far East Flight of the R.A.F. in its cruise, with metal-hulled Southampton flying-boats and Napier engines, towards Singapore emphasises more than anything else could have done the importance of flying-boats in the development of British Imperial Aviation. And the unfortunate mishap to ir Alan Cobham's Short Singapore, itself one of the finest types of flying-boat in the world, indicates the need for urther development in flying-boat design and construction f we are to get the fullest advantage out of a type of aircraft which we have made particularly our own.

There was a period after the War 1914-18 when for some years the development of flying-boats was sadly neglected. There was very good reason for that neglect, but it was none he less regrettable. The whole existence of the Nation depended on economy, and all expenditure on everything which was not immediately productive, or at any rate of immediate political importance, such as the dole for unemployables, had to be ruthlessly axed.

The Royal Air Force, as most of us remember, was practically destroyed. What little money was voted for it had to be spent so as to show the greatest possible results. Housing had to be provided for men and machines and a new generation of mechanics had to be trained before we could think of new machines, or new squadrons. Practically all we kept were fighter squadrons, and general purposes squadrons, and Army co-operation squadrons, and a few flights of seaplanes—equipped with obsolete War-time types.

Airships were absolutely scrapped because they are so costly to build and operate. And flying-boats, as about the next most costly form of aircraft, were perforce almost equally neglected.

The big flying-boats which the late John Porte had developed at Felixstowe, and the still bigger developments such as the Atalanta, were interesting experiments, but we could not afford to go on experimenting along those lines simply because of the cost. They were not successful because their general idea was ahead of our experience. Yet it was clear to those who had the foresight to order them that along those lines must lie one of the most important branches of Imperial Aviation.

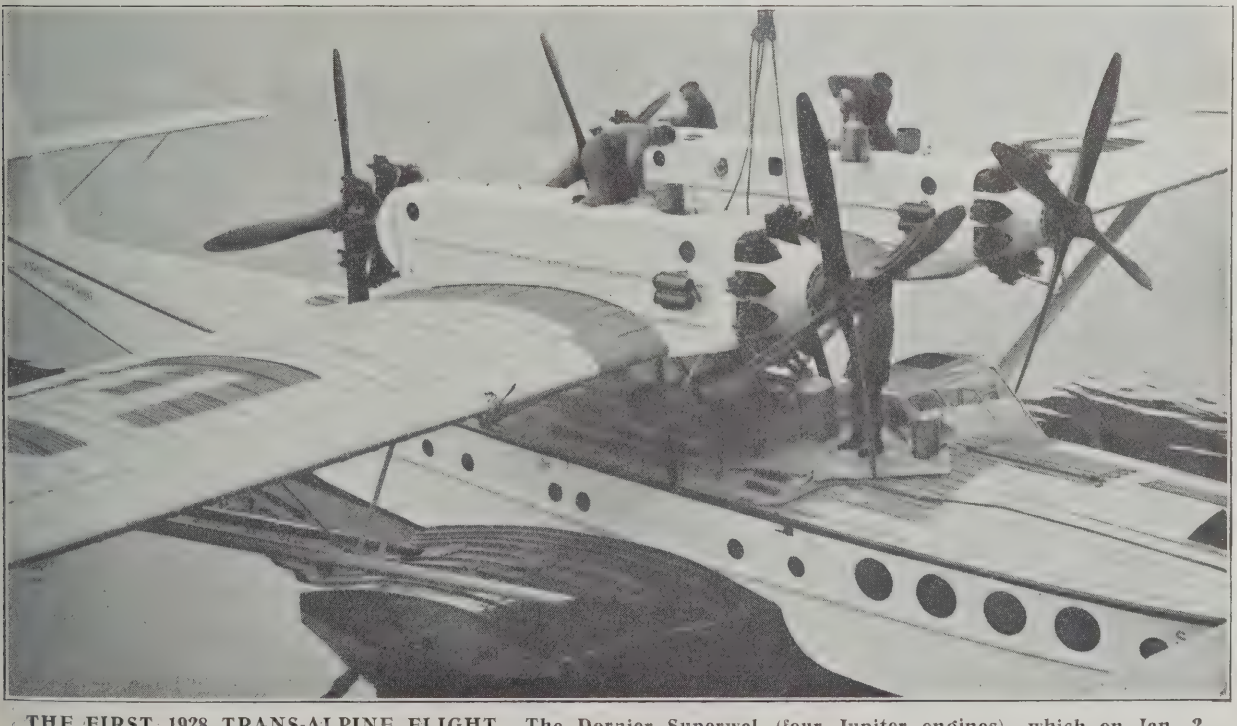
Practically the only development work done with flying-boats during those years of the Great Slump was done independently by the Supermarine Company, and the only support it got was the purchase of a few of its boats by the Air Ministry,—and by certain foreign Powers.

As the financial position of the British Nation improved, and a little more money became available for the Air Force, that money had to be spent on re-equipping Service Squadrons and making R.A.F. stations fit for human habitation. But, as soon as the money could be spared for the job, the Air Ministry, with that foresight which it has always shown, in its larger affairs, though it gets little enough credit for it, began to spend money on flying-boat development.

OUR SUCCESSES.

Certainly our first outstanding success along this line was the Supermarine Southampton. This boat, with its two Napier Lion engines, put up a better performance than any existing land machine with the same power. It got off with a shorter run, it flew faster when it was in the air, and it lifted a bigger paying load.

To-day we have in the Blackburn Iris, the Short Singapore, the Saunders Valkyrie, and the metal-hulled Southamptons, with their varied power plants, flying-boats which are far in advance of any similar craft built by other nations.



THE FIRST 1928 TRANS-ALPINE FLIGHT.—The Dornier Superwal (four Jupiter engines), which on Jan. 2 was flown from Friedrichshafen to Genoa for delivery to the Societa Anonima di Navigazione Aerea. The distance of 360 kms. was covered in 2 hours. This machine, the latest development of its type, will be used on the Genoa—Rome—Palermo air line of the above company.

But just because we are in advance we must not adopt that attitude which is one of the besetting sins of the English, that is of sitting down and admiring our handiwork till somebody else beats it. We have got to go ahead developing our flying-boats till they come as near as is humanly possible to defeating the elements with which they have to deal.

THE IRRESISTIBLE ELEMENTS.

The happenings in England of the past few weeks when, despite our boasted civilisation, communications were entirely blocked by snow, and nigh a score of people were drowned in their beds by a mere river flood, show how utterly futile is man's finest handiwork when really up against the forces of Nature. Therefore we cannot hope ever to produce a transport vehicle, for land, sea, or air, which will be utterly undefeatable. But we must do all we can to assure the safety of those who use such vehicles as modern science provides for them.

Sir Alan Cobham's unfortunate experience may well prove to be a blessing in disguise. At any rate it was a blessing for him and his good lady and their companions that they met that Mediterranean gale in harbour where they could be rescued and were not brought down by some mechanical trouble into such a gale in the open sea far from help.

What happened to them indicates one of the things for which flying-boat designers and constructors must provide when we start, as we must do some day, building still bigger flying-boats for long-distance passenger traffic and for long-distance Service patrols.

One does not believe that any wing-structures can ever be built which would stand up to the smash of a full sea in an ocean gale. But every designer knows that it is quite possible to make a small boat which will ride out the heaviest gale. You cannot withstand the elements, but you may outwit them.

BLUFFING THE ETERNAL SEA.

Therefore, quite obviously, the next task to be tackled by flying-boat designers is so to construct their craft that the hull itself shall be a seaworthy motor-boat, as capable of standing up to a full gale as is any ocean-going fishing smack, and so to connect that hull to the wings, power-plants and tail-unit that, in time of emergency, it can get rid of all its superstructure and become a trustworthy lifeboat.

This problem has been mentioned casually in this paper at various times in the distant past as well as quite recently. And it is one which has now become of prime importance.

It is not at all a difficult problem. It involves very ordinary matters of mechanical engineering for which no special aerodynamic knowledge is necessary, though, of course, the means employed in attaching and detaching the hull from the superstructure must fit in with the aerodynamic demands of the machine as an aircraft.

In these days, when everybody seems to accept the idea that all flying-boats in future will have metal hulls, the problem is probably even easier than it would have been if we had gone on using wooden hulls in which the wing and tail structures were part and parcel of the hull.

There is the additional advantage about this type of craft that when it is used for regular air lines it can alight in open harbour and moor its wing- and tail- structures to prearranged buoys. The hull can then run up to the docks, through the crowded shipping, to unload and reload passengers, while the aero-engines are being re-fuelled and inspected at the buoys.

FOR OCEAN AIR-LINES.

Consider this matter of the detachable hull in relation to any possible ocean-going air-route and you will see its immediate importance. It is the one way in which a trans-Atlantic air line, other than by airship, can be made a reasonably safe proposition.

With increasing reliability in engines, and a multiplicity of engines, and methods of stopping engines which are running badly and repairing them in the air, we may attain to a state when hundreds of flights may be made across the Atlantic, at any rate on a short route from North Ireland to Newfoundland, or Portugal to the Azores, before a machine is forced to alight at sea. With our existing knowledge of flying-boats there should be no difficulty whatever in building machines which would cover such a route across the Atlantic at a cruising speed of 130 m.p.h.

Even when a machine was compelled to alight, it might in most cases have the luck to do so in fair weather, and the crew might be able to set right its trouble and get off again without damage. But before the Atlantic passage can be considered a reasonable proposition we must be prepared to guarantee to passengers that if they do come down in a gale they will have at any rate as much chance of being rescued as if set adrift from a wrecked liner in a ship's lifeboat.

So long as we cannot offer that much chance of safety we cannot expect travel on trans-oceanic air-lines to be anything less than a great adventure. And, as Sir Alan Cobham always says,—so long as flying is an adventure it is not commercial transport.

Here one would remark that, though somebody will certainly fly the Atlantic from East to West this year, and will

AIR SURVEY IN CANADA.—An Aeromarine seven-passenger flying-boat with metal hull (400 h.p. high-compression Liberty) belonging to Fairchild Aviation Ltd. Sitting in the machine, left to right: E. Thibault, helper; G. W. Dean, late R.A.F. pilot; A. Ward, Air Engineer; J. Humble, Air Engineer. In front of the machine, left to right: Charles Sutton, late R.A.F. pilot; G. W. Burges, late R.A.F. Fleet Air Arm pilot; H. M. Pasmore, pilot; Pierre Pronovost, caretaker; W. Thibault, rigger, and K. F. Saunders, pilot and Manager of the Flying Division.

456 kilometres per hour for 100 kilometres

NOTIFICATION has been received from the Féderation Aéronautique Internationale that by Flight-Lieut. S. N. Webster's achievement in the Schneider Trophy race, Great Britain has secured the World's Speed Record over 100 kilometres.

Over this distance (approximately 62 miles) Flight-Lieut. Webster maintained a speed of 456.222 kilometres or 283.313 miles per hour.

The machine was a Supermarine-Napier S.5, and the engine the -

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'PHONE: CHISWICK 1220 'GRAMS: MONEYER, ACT, LONDON no doubt make much money in America by doing so, the flight will only come under the generic heading of Dud Stunts unless it is done on some machine, or in some way which marks a step towards safe ocean flying.

The Real Imperial Air Way.

Apart altogether from the trans-Atlantic journey there are all our other Imperial communications to be considered. We cannot have an All-Red air-route to our Eastern Empire. Unfortunately the Continent of Europe intervenes.

But we may very well, when air transport develops, and our recent Allies, the French, have been persuaded to let us run our land machines through to Marseille, establish a line of big flying-boats from Marseille by way of Malta either to Egypt, or, when the oil port of Jaffa has been completed, with its pipe-line to 'Iraq, connect there with the over-land line to Baghdad and Basrah.

For several months Imperial Airways Ltd. have been considering a flying-boat line from Basrah down the Arabian side of the Persian Gulf to Karachi. That gets over all the trouble of Persian obstructions, whether inspired by German trade rivalry or Russian Bolshevik influence.—Always provided that reasonably safe anchorage can be found at intervals down the coast.

For such a line in shark-infested waters obviously a lifeboat flying-boat is as necessary as it would be in the Atlantic. To cross the gulf from the Arabian side to Baluchistan in land machines would be sheer insanity

From Karachi doubtless the line will be worked by land machines to Calcutta. But from Calcutta to Singapore obviously a flying-boat line is preferable to the use of land machines. Although so many land-going aeroplanes have managed to fly down the coast of Burma and the Malay States to Singapore, the country is utterly unsuited for forced landings by such machines, and those which have got there have done so by the Grace of God and their engines.

On the other hand, the coast is full of inlets where flying-boats could find shelter, and where, even if the superstructure had to be abandoned in a gale the motor-driven hull could safely make a harbour.

From Singapore to Australia the same argument holds even more strongly. That line across the friendly Dutch Oil Islands is essentially a flying-boat proposition.

The Opportunity for the Flying-Boat.

Wherever one looks all over the map of the British Empire one sees greater and greater opportunities for flying-boats. And the more one considers flying-boats the more one sees their advantages over land machines with their cumbersome but necessary undercarriages. But if we are to get our best Imperial service out of flying-boats they must be made safe.

Paying passengers expect safety, and trained Service personnel cost so much to train that, purely as a national economy apart from any question of humanity, we should be wise in spending money on providing for their safety. And so one commends this problem of the life-saving flying-boat to our technical people, both at the Air Ministry and in our aircraft factories.—C. G. G.

"AERONAUTICAL ENGINEERING."

With the issue of The Aeroplane dated Jan. 25 will reappear the *Aeronautical Engineering* Supplement which has been held in abeyance during the past few years.

Readers of this paper during the later years of the War and the two years thereafter will remember that during that period *Aeronautical Engineering* published a mass of technical information of high value to the many engineers who were then engaged on aircraft construction. Then came the Great Slump. The Aircraft Industry was cut down to a very small close corporation in which the technical men were so few, and, incidentally, already so highly informed in such knowledge as existed, that no good purpose could be served by publishing technical information for their benefit in this paper.

At the same time, owing to the lamentable decrease in advertising revenue, The Aeroplane had to be cut down in size till there were actually not enough pages in which to deal adequately with practical flying, descriptions of new aircraft and aero-engines, the affairs of the Royal Air Force, and aeronautical politics, all of which appealed to a vastly greater number of readers than would highly-specialised engineering technics. The engineers could get their knowledge from official technical publications of all nations, if they were devoted enough to their profession. The task of The Aeroplane seemed to be rather to spread knowledge of practical flying, and to fight the political battles of the Air Force and of Civil Aviation so far as could be done with the few pages it could afford.

Now one judges that we have reached a new phase in British Aviation. A new generation is arising. Young and energetic draughtsmen and designers are coming into our aircraft factories, the staffs of which are being increased as the Aircraft Industry grows. Young men at the Universities and in the higher forms at schools, are taking an interest in Aircraft Engineering, with an eye to making it their profession —as indicated by Sir Alfred Yarrow. And, above all, many young officers and men in the Royal Air Force, recognising the wisdom of Sir Hugh Trenchard's dictum that the road to success lies in being an engineer as well as a fighting man, are becoming vividly interested in technical matters.

Aeronautical Engineering, which will be issued as a supplement to The Aeroplane on the last week of each month, is designed to help such seekers after information. Basic research will not be preferred to *ad hoc* research. The higher mathematics will not be considered as more valuable than performance figures. It will endeavour to give plain facts and figures of value to practical engineers, and to discuss practical progress rather than pure theory.

There are those who have in the past failed to recognise The Aeroplane as a technical paper because it has not filled its pages with formulæ and calculations. While scientists of equally high repute have been contradicting one another flatly, as is their custom, The Aeroplane has gone past mere paper calculations to plain common-sense engineering and has steadily advocated such things as slotted wings, metal airscrews, new theories of streamlining, methods of reducing head-resistance, geared engines, improved designs for fighting machines (as in the specification for a fighter in the first issue of 1927) and for commercial machines (for the past eight or nine months).

In all these matters the suggestions of The Aeroplane have been followed sooner or later not only by our own designers but by designers all over the World. But because the arguments have been stated in plain language and have not been bemused by graphs and formulæ, some people still deny that this is a technical paper. One would merely ask how many Fellows of learned societies can point to their work having had as much influence on the engineering side of their particular industries.

Be that as it may, The Aeroplane now proposes to become a trifle more technical, in recognition of the increasing demand for engineering knowledge. *Aeronautical Engineering* will not pretend to give a complete education to aspiring engineers. But it will give much useful practical information. And, by means of condensed extracts from learned papers by qualified scientists, by reviews of all the World's technical publications, it will indicate clearly where those in search of deeper knowledge can get it. And, as the number of copies of this paper produced each week is necessarily limited, one recommends those who wish to make sure of getting *Aeronautical Engineering* to order it in good time.—C. G. G.

"THE ARMY, NAVY AND AIR FORCE GAZETTE."

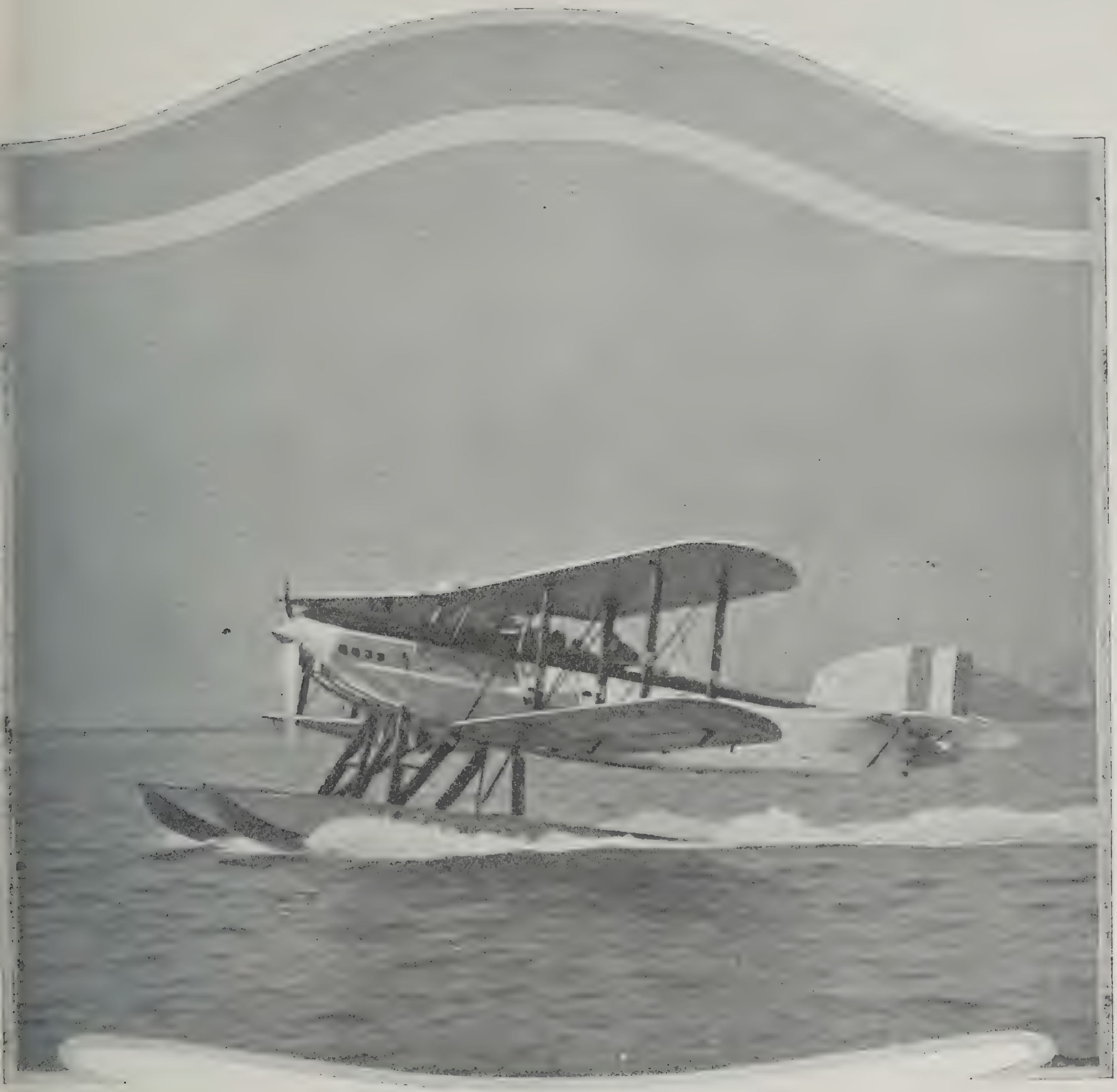
With its first issue of the New Year, *The Army, Navy and Air Force Gazette*, having completed sixty-eight years of useful life, has changed its form. And the change is very much for the better.

Its pages are smaller, and there are more of them. Its columns are wider and more pleasing to the eye. And it maintains its high standard of printing in its more popular form.

In the old leisurely days when a man could spread himself in a big chair in the ante-room or the club and take pleasure in a spacious page, the old shape was doubtless good. But in these days, when the Services do their reading hurriedly in staff-car or railway train or at odd moments in the office, a small paper which can be rammed into the pocket has its advantages.

The contents of the *A., N. and A. F. Gazette* continue to improve. Colonel Rowan Robinson's recent article on Mechanised War is of high value, and should be read by all Air Force officers,—seeing that aircraft will have so much to do with and against mechanised troops in future wars. An article on the German troops in Palestine,—written with information and humour by one of the greatest of our military writers—is of singular interest. And the editorial notes, apt and incisive as they are, by Major W. E. de B. Whittaker, should not be missed by any Air Force Officer who wishes to grasp the Army's point of view on the subjects which exercise the mind of the Service each week.

The Navy's views and doings are equally well exposed. And the affairs of the Air Force receive adequate attention, always from the strictly service aspect. It is a paper which should be read regularly by all R.A.F. officers who are intelligent enough to realise the value of understanding the points of view of the Senior Services.—C. G. G.



The Fairey III.F. as a Seaplane.

The Fairey Aviation Company, Limited, are in full production with the General Purpose and Fleet Air Arm Types of the latest successful aircraft, the Fairey III.F. The demand for the Fairey III.F. was the response to the creation of the only British aircraft designed to meet both the Naval and Military requirements of the Royal Air Force, without sacrifice of performance. Land and sea undercarriages are interchangeable in two hours. Wide adaptability, outstanding performance, exceptionally robust construction, have put the Fairey III.F. into full production for H.M. Britannic Government and Foreign Governments.

FAIREY

Aircraft

CHANGES AT THE ROYAL AIRCRAFT ESTABLISHMENT.

In the ordinary course of Civil Service routine Mr. W. Sydney Smith will retire in April from the post of Chief Superintendent of the Royal Aircraft Establishment, which he has held since the old Royal Aircraft Factory—of odious memory—acquired its present title, with the coming into being of the Royal Air Force in April, 1918.

Mr. Smith was previously a Permanent Civil Servant and has been an Inspector of Factories. As Superintendent R.A.E. he has done much good work. He has promoted efficiency and economy. He has worked hard for good feeling between the Aircraft Industry and the R.A.E.

That the R.A.E. is still regarded in the trade as an unjustifiable extravagance which annually absorbs some £400,000 most of which could be spent with better results on experimental contracts with Trade firms, is no fault of his. As in so many Government establishments, the Augean Stables of the R.A.E. are in such a state as to defy any official Hercules. But Mr. Sydney Smith has certainly got along with his job in spite of difficulties. He deserves the gratitude of the Trade. And as he has won the esteem of all who has come personally in contact with him.

The new Chief Superintendent R.A.E. is to be Mr. A. H. Hall, at present Superintendent of Production at the Royal Airship Works, Cardington, where R.100 is being built,—Group Capt. Peregrine Fellowes, D.S.O., R.A.F., being Director of Airship Development.

Mr. Hall was born at Clifton, Bristol, and educated at Clifton College and Cambridge. He served his apprenticeship to shipbuilding with Denny's of Dumbarton, and so is a Clyde-trained engineer—than which there is no finer class.

In 1904 he joined the staff of the Royal Ordnance Factory, as a supervisor, and shortly afterwards became an assistant engineer. In 1914 he was made Assistant Superintendent at the Royal Small Arms Factory at Enfield Lock (whence proceeded the Lee-Enfield rifles). Soon after the outbreak of War, in 1914, he was appointed to buy and instal plant for mass-production of war material at Woolwich Arsenal. Then he was made Director of Torpedo and Mine Production at the Admiralty.

In 1919 he went to the Ministry of Munitions to control the Miscellaneous Stores, and the section formed for the sale of metals, chemicals and explosives. In 1926 he was appointed to his present job at Cardington.

Such a varied career seems to fit him admirably for his post at the R.A.E. His dealings with civilian manufacturers and merchants both at the Admiralty and the Ministry of Munitions must have given him a very wide experience of the manners and customs of the world of Industry, and his widely varied experience of engineering work—including as it did and does the highly specialised class of construction developed at Cardington—will bring the activities of Farnborough well within his grasp. But most of all one likes to know of him as a Clyde-side engineer. One wishes him all success in his difficult task at Farnborough.—C. G. G.

A PARADE OF ANCESTORS.

A suggestion has been made that the next R.A.F. Display might be made still more interesting if some of the old original machines with which flying began in this country could be demonstrated thereat. The suggestion comes in the following letter :—

> Sir :—I have recently had the privilege of reading Major C. C. Turner's Book *The Old Flying Days*, and it occurs to me that a practical demonstration of the advance aviation has made during the last twenty years could with advantage be given to the World at the next R.A.F. Pageant, if some of the most interesting ancestors of the present machines were dug up, reconditioned, and at any rate paraded amongst some of the latest types.
>
> I have no doubt that fitted with low or medium-powered engines, some of these could be made to fly (that is to say if there is anyone daring enough prepared to take the risk!).
>
> Such machines as the Short-Wright machine launched from the original catapult, the Cody biplane, or the Channel type Blériot, would form interesting comparisons. If they are not at present in existence, copies could perhaps be constructed by pupils of some of the R.A.F. Schools if the drawings were available, though I believe examples actually exist in the Science Museum at South Kensington.
>
> (Signed) G. N. D.

One believes that some such idea has already been considered by those who are officially responsible for the programme of the R.A.F. Display. The objection is, of course, that such of the original machines as still exist, would now fall to pieces if taken off the ground, or even wheeled along it. Moreover, according to our modern lights, even if they were brand new, not one of them would be granted an airworthiness certificate. Apart from the fact that none of them would pass the A.I.D. constructionally, they would every one of them be considered dangerous aerodynamically—and very rightly so.

All their side areas, centres of gravity and control surfaces were hopelessly wrong and they were merely kept in the air by the sheer skill of the pilots, as the result of slow and assiduous practice. The wonder is that anybody who flew between the years 1909 and 1914 is still alive to tell the tale.

If replicas were built they could be made airworthy constructionally, but if they were made airworthy aerodynamically, they would not resemble the originals. The tail-first type, such as the Wright and the Cody, was an absolute death-trap, as was demonstrated recently by the unfortunate Mr. Focke with the Focke-Wulf in Germany.

A parade of such machines on the ground would be interesting, but one doubts whether it would be worth the cost of building the machines.—C. G. G.

THE AUTOMATIC SLOT FOR THE U.S.A.

According to Press reports, the Navy Department at Washington announced on Jan. 13 that the U.S. Government had acquired the patent rights in the Handley Page automatic type of slot gear and that the automatic slot would be adopted in the future in all new American Service aeroplanes.

(The U.S. Government some years ago purchased the American patent rights in the original type of Handley Page slot for a very substantial sum, but do not as yet appear to have made any practical use of the device.)

MR. R. F. CAREY.

All those in the R.A.F. and in the Aircraft Industry who have had to do with the catapulting of aircraft will learn with regret of the death of Mr. R. F. Carey, who has been primarily responsible for designing and developing the types of catapult used by the Fleet Air Arm. The following notice appeared in *The Times* :—

> Mr. Robert Falkland Carey, the inventor of a device for launching aircraft from warships, died at Leigh-on-Sea, on Jan. 3. In the early part of the Great War, Mr. Carey was associated with Messrs. Waygood, Otis, lift manufacturers, in their engineering department. He was the patentee of several inventions in connection with that industry.
>
> The first successful trials of his catapult device were carried out during the year 1925 from the cruiser *Vindictive*. The First Lord of the Admiralty recently stated that the new County class of cruisers would each be fitted with a catapult. The battleships *Nelson* and *Rodney* were also to have the device later.
>
> A general description of the method of working the catapult appeared in *The Times* of Mar. 4, 1926. A horizontal girder track, about 50 ft. in length, along which a small trolley could be propelled, was erected in the forepart of the ship. The aircraft to be launched was anchored to the trolley and held rigid until the moment of release towards the end of the track. The engine of the aircraft would be running, and the problem was how to shoot off the machine and pilot, weighing perhaps 3,000 lb. or more, into the air at a speed of about 35 or 40 miles per hour.
>
> Over two years ago a similar device for launching aircraft was in use in Italy. The method was that of a trolley worked by compressed air. In the United States the force necessary for the same purpose was generated by the explosion of a gun charge.

The idea of catapulting aeroplanes from ships is very old. And readers must remember that the first human flight, by Orville Wright in 1906 was launched by a catapult device,—which mode was used by all Wright machines up to 1910.

Before the War 1914-18, Lieut. Spenser Grey, R.N., then commanding at Calshot, had worked out on paper a ship-catapult in which a conical windlass was used to give the acceleration needed to raise the speed of the machine from nil to flying-speed.

The U.S. Navy used catapults experimentally by 1918. And in 1924, when one was in the States, the "gun-powder" catapult was already in use.—C. G. G.

COLONEL J. P. KOCH.

All who have had to do with the small but highly efficient Danish Army Flying Corps will learn with regret of the death, in the Garrison Hospital at Copenhagen on Jan. 12, of Colonel J. P. Koch, who has been for many years the Officer Commanding that Arm.

Colonel Koch qualified as aviator in 1917, though by no means a young man then, and ever since has devoted himself to promoting the efficiency and improving the equipment of Danish Army Aviation.

Apart from serving his King in this manner, Col. Koch won for himself in his younger days high distinction as an Arctic explorer. In 1900 he was with Lieut. Amdrup, mapping the North-East coast of Greenland. From 1905 to 1908 he was with the expedition in which Mylius Erichsen, its leader, lost his life. Koch himself and some companions were exploring the coast of Peary Land when Erichsen died, and on his return he took out a party which found Erichsen's body and the papers with his observations. In 1912-13 he led an expedition through Greenland, with Dr. Vegener and others, from Louise Land to Lakse Fiord.

He was a brave man and an efficient officer. To all Danish Aviation one extends the sympathy of those concerned with British Aviation.—C. G. G.

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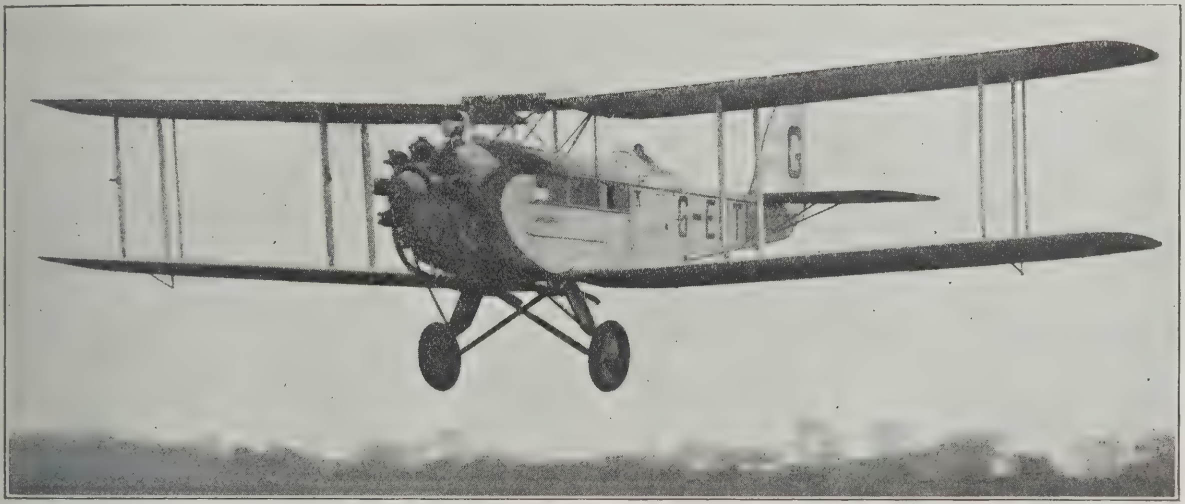

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SAFETY AND RELIABILITY.

Safety and reliability are qualities of the first importance in any form of commercial transport and the fact that at present aircraft cannot claim to have proved themselves either as safe or as reliable as some other types of competing vehicles is one of the most serious handicaps to the rapid development of civil aviation.

These two qualities of safety and reliability are usually considered to be very closely related to one another, particularly in the case of aircraft. There are many reasons why they should be so treated, but it is well to recognise that ultimately they have no necessary connection.

Aircraft of to-day fail in reliability and safety mainly because they are apt to suffer from forced landings. This is essentially a failure in reliability. Danger enters into the affair as a secondary effect simply because a forced landing under bad conditions means some danger of a crash.

For the last year for which official statistics are available about one flight of every forty-five started by a British commercial aeroplane suffered an involuntary stoppage. Not all these involuntary stoppages were in the ordinary sense forced-landings, but certainly one-half of them were such that some risk accompanied them.

Practically all forced landings of this type nowadays are the result of power-plant failures. Cut out power-plant failures without altering any of the other characteristics of aircraft and to all intents and purposes you will achieve both safety and reliability.

Experience shows that mechanisms are never wholly free from the chance of a breakdown, therefore it is idle to hope for the perfectly reliable power-plant. One may very reasonably hope that the future will give us power plants very much more reliable than those which are now in use. And it is equally reasonable to expect that by the time we have these more reliable power plants we shall have also very much more efficient, and very different, aircraft.

Suppose that power plants have become so reliable and that various other auxiliary details have so improved that instead of one in forty-five flights, only one in one thousand flights suffers an involuntary interruption. We shall then have reached a stage where air transport has become relatively reliable.

But it will not necessarily have become safe. If the characteristics of the aircraft have so changed that any forced landing means an almost certain crash flying will have become even more dangerous than it is now.

It may be thought that the supposition is on the face of it absurd, for no aircraft designer or user would dream of producing or using aircraft which inevitably crashed on a forced landing. The supposition is not so absurd as it seems—there are many people to-day who look forward to the time when aircraft engines will become so reliable that long oversea commercial journeys may be made on machines which cannot float. These people contemplate using a type of aircraft which would inevitably crash—with fatal results to all on board—in 99 per cent. of their forced landings. Yet with twenty times the reliability of present day aircraft they would be more dangerous than the Civil Aircraft we know to-day.

Just as it is possible to conceive of an aeroplane that is highly reliable—in the commercial sense—without being therefore particularly safe, so it is possible to conceive of an aircraft that is safe without being at all reliable. By combining a very low landing speed with modern control gears and an undercarriage with very large shock-absorbing qualities, it would be possible to make a safe aeroplane, that is, one that was exceedingly unlikely to damage any of its occupants whatever might happen to its power plant. And if the power plant is unreliable so is the whole aeroplane.

The intimate connection between safety and reliability present aircraft is largely the result of the undeveloped sta of aeronautical engineering, and as the art develops the co nection between the two will become looser and looser, a it will be more and more possible to consider the two subje separately.

The first duty of a machine for air-line work is that should leave one terminal air-port with its proper load a that it shall arrive punctually at the other terminal on route. But in designing a machine for this purpose the reliability of the machine has to be considered. It is fai certain that such a machine will have forced-landings duri its career. And its undercarriage has to be designed wi this probability in view.

If the designer could consider the problem of the forc landing from the point of view of safety only, his difficulti would be much reduced. But he has to consider reliabili and economy. These considerations mean that not on must he give the machine a reasonable chance of landi safely away from its regular ports of call, but he must p vide it with a means of getting off after any forced-landi and thus of completing its journey with the least possib delay if the defect which caused the landing can quickly remedied.

If the risk of a London—Paris machine landing anywhe else than at Croydon or Le Bourget were very small, inste of as large as it is, commercial operators of such lines wou be content if on the rare occasions when an intermediate s down did occur, the machine could land safely and witho risk to the occupants. The passengers would be delayed un they could be sent to the nearest aerodrome and taken on another machine, and the machine itself would have to partly dismantled and taken home by road. This would n matter if the occurrence were sufficiently rare.

And the machine would not then have to carry its gettin off gear about with it. This would be aerodrome equipmen not part of the machine at all. The machine would take the form—more or less—of a flying-boat which would lan on a skid-keel, would pull up more rapidly than any wheele machines, even braked, could do, and which could not possib turn over when landing on any sort of ground.

In large sizes—despite the opinion of a distinguished techn cal officer of the Air Ministry—the flying-boat is already efficient aerodynamically as any commercial passenger-carr ing aeroplane. It is a very much safer machine than the lan type, because it can alight not only on the sea, but anywhe that a land machine can alight on the earth and in man places where a land machine cannot alight without certai disaster.

It is true that the average flying-boat hull would deteriora rapidly, if it was habitually landed on Croydon Aerodrom That however could easily be cured by providing suitab landing strakes on the hull.

The flying-boat hull is admirably adapted to being shot from a catapult, and can easily be arranged to fit on a gettin off trolley which would remain on the aerodrome.

And if a flying-boat has to land on really bad ground—where the wheeled aeroplane would inevitably turn over—it stands a very good chance indeed of sustaining relativel minor structural damage, and will pretty certainly stop righ side up.

Therefore it seems reasonable to suggest that when t happy days of the really reliable power-plant arrives, we sha not use aeroplanes across sea, but we shall use seaplane across both land and sea.

For by that time the problems of safety and of reliability wi have separated themselves and each will be considered on i own merits.

THE NEW A.D.C. ENGINE.

The A.D.C. Aircraft Co. Ltd. announce that the great success of their Cirrus Mk. I and Mk. II engines has led them to adopt a policy of producing other engines of the air-cooled in-line type of increased output.

The first of these new engines will be of a little over 100 h.p., of about the same weight as the Cirrus, and embodying the same simplicity and robustness of design as is found in that engine.

An engine having these characteristics is precisely what is wanted for installation in the popular British types of light aeroplanes for use under conditions where an abnormal reserve of power is necessary, and there should be a large demand for such an engine for light seaplanes or for light aeroplanes to operate at high altitudes and temperatures such as are encountered in South Africa and other parts of the Empire.

THE ROYAL AERO CLUB.

The Annual General Meeting of the Members of the Roya Aero Club of the United Kingdom will be held at 3, Cliffor Street, London, W.1, on Mar. 28, at 6 p.m.

Notices of Motion, signed by at least five Members, mus be received not less than 21 days before the Meeting.

In accordance with the Rules, the Committee shall consis of 18 Members. Members are elected to serve two years half the Committee retiring annually.

The retiring Members of the Committee, all of whom ar eligible for re-election, are :—Air Vice-Marshal Sir W. S Brancker, K.C.B., A.F.C., Sir Alan J. Cobham, K.B.E., A.F.C. Lord Edward A. Grosvenor, E. J. B. How, Colonel F. Lindsa Lloyd, C.M.G., C.B.E., Lieut.-Colonel J. T. C. Moore-Braba zon, M.C., M.P., Lieut.-Col. M. O'Gorman, C.B., Major H. A Petre, D.S.O., M.C., Brig.-Gen. Lord Thomson, P.C., C.B.E. D.S.O.

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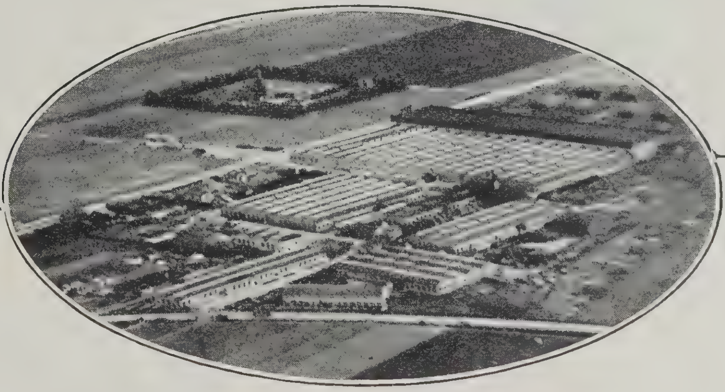
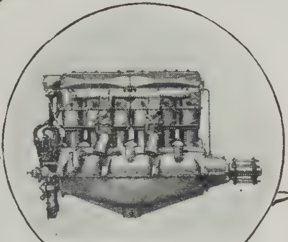


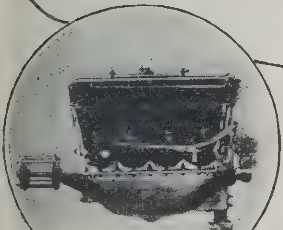
Aerial View of A.D.C.
Works at Croydon.

D.H.9 Puma Engine



240 h.p. Puma Engine

Avro type, 504K.



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THE ORGANISATION OF RUSSIAN AIR POWER.

(The following account of the organisation of Aviation in Russia is a translation of an article by A. B. Scherschewsky which appeared in *Der Flug* for the second half of December, 1927.)

The High Command of the Land, Sea and Air Forces is jointly under the *Narkomvoenmor* (People's Commissar for the Army and Navy) and the President of the *Revvoensowjet* (Revolutionary War Council), Commodore Konstantin E. Woroschilof. The chief executive officer of the Military Air Force is Commodore Petrus J. Baranof and the Director of Commercial Aviation is General Woldemar M. Wischnef. The Higher Command of the Russian Air Fleet is controlled by the *Glawnoe Uprawlenie Wosduschnawo Flotta* (Chief Directorate of the Air Fleet) in Moscow with various Departments for the Red Air Force and the control of the Civilian Air Fleet. The Departments dealing with aerial equipment and industry are attached to this Central Directorate.

Instruction and training of superior technical personnel, including the future officers of the Air Force and technical staff for the production of aircraft, takes place at the Military Air Academy. This Academy is divided into two sections: Military, with sub-sections for Army and Navy Air Forces, and Civilian, with sub-sections dealing with the design and construction of aircraft, aero-engines, airships, air transport, and aerodynamics. The courses extend over four years divided into eight half-yearly terms, the studies are free, and the pupils are admitted after a thorough examination, scientific, medical and political, of candidates submitted by various associations.

One Aviation College for civilian engineers under Prof. Nikolaus A. Rynin is installed in the School of Highway Engineering, Leningrad.

The whole aircraft industry is in the hands of the State. There are about 20 aircraft factories.

All-metal construction is controlled by the Central Aero-Hydrodynamic Institute (C.A.H.I.) of Moscow, where also marine craft and accessories are manufactured under the leadership of Prof. Alexander N. Tupolef, after whose initials (A.N.T.) the Russian all-metal machines are named.

The Russian light metal *Koltjugalljuminii* is produced by two factories, the *Koltzchuqino* Works in Wladimir and the *Krassni Wyborschetz* in Leningrad.

Designs for machines are prepared by the C.A.H.I. and they are made at the above factories, and afterwards submitted to Dipl. Ing. J. J. Sydorin of the C.A.H.I. for inspection.

The central organisation for all technical aeronautics and science is the *Nautschniikomitet U.W.S.S.* (Scientific Commission of the Direction of the Air Force) in Moscow. The central department for technical research and development is the C.A.H.I., which has grown in extension and equipment to gigantic dimensions. At the present time it is the largest Technical Aircraft Establishment in the World and it has three wind tunnels, one compressed air tunnel, a water tank of the Froude type 560 m. long, three airscrew test stands, one whirling arm of 6 m. dia. (in course of erection), two engine test benches, and much other accessory equipment.

Other smaller Technical Establishments are that of Prof. N. E. Joukowsky at Moscow, that of N. D. Riabouschinky at Kutschino, of Prof. N. A. Rynin at Leningrad, of Prof. A. N. van der Flit and Dipl. Ing. W. A. Selesaref, at the Polytechnic in Leningrad-Lesnoye, and of Prof. D. N. Seyliger, in Kasan.

The design and inspection of aero-engines is under the control of the *Nautschnii Auto-Motorni Institut* (Scientific Motor Engine Institute) under the Direction of Prof. N. R. Brilling and Dipl. Ing. A. A. Mikulin, N. N. Krelsckich, W. M. Ruk and Korol. At the present time the Institute is designing air-cooled radial engines and water-cooled engines of higher power. The Bolschevik M5 engines (400 h.p. 8-cylinder Vee-type) are built at the Bolschevik Works in Leningrad.

The official organ of the Directorate of the Red Air Force is the monthlly paper *Westnik Wosduschnawo Flotta* (News of the Air Fleet), Moscow, and as from July, 1927, there has appeared a second official technical publication, the *Technika Wosduschnawo Flotta* (Air Fleet Technics), Moscow, which is similar in scope to the German monthly paper *Z.F.M.* And there is the *Woina I Technika* (War and Technics) (84 issues per annum), published by the Army High Command, devoted to aviation.

A newspaper called the *Wosduchoplawanie*, of Moscow, is entirely devoted to aviation. The newspaper *Motor* devotes many pages to aviation. The C.A.H.I. issues the Reports and Transactions of the C.A.H.I., of which 21 numbers have already been published.

While all these technical institutions are limited in membership to a few selected individuals, the actual representative body for the great mass of aviation workers and builders is the *Ossoaviachim,* which is made up of the O.D.V.F. (Society of the Friends of the Air Fleet), the *Dobrochim* (Society o the Friends of National Chemical Defence), and the *Oss* (Society for National Defence.)

The Ossoviachim is divided into 10 Committees or Departments under individual management, and each departmen has a sub-section for propaganda. The membership of th *Ossoaviachim* is about 3,100,000. The capital of the Association is in round figures 18 million roubles. The official orga of the *Aviachim* (until its amalgamation with the *Osso*) wa the monthly paper *Samolet* (Aircraft) which is now change into *Aviatzia I Chimia* (Aviation and Chemistry).

The *Ossoaviachim* has formed 32,000 associated clubs o cells throughout the country, has purchased and handed ove 160 aircraft to the Air Fleet, has spent 6,000,000 roubles o aircraft and chemical warfare development, has provided 3 well-equipped aerodromes, has held gliding meetings in th Crimea, and organised many other flying exhibitions, ha run an aviation lottery, and will shortly run another, and ha carried on propaganda work for aviation on a vast scale. I has printed and distributed 15 million posters and 25 millio pamphlets.

Civil air traffic in the Union of Soviets is controlled by thre concerns—the Deruluft in which German capital is ver largely and directly interested, the Ukrvosduchput (Ukrainia Air Traffic Co.) and Dobrolet (Volunteer Air Fleet Co.).

AMERICAN AIRCRAFT PRODUCTION IN 1927.

An article in *Aviation* for Jan. 2, 1928, gives some ver interesting data concerning American aircraft productio during 1927. In the main the figures given are drawn fro figures supplied by the actual manufacturers in reply to *questionnaire* issued by *Aviation,* but where replies have no been made, estimated figures which are believed to be ver close to the truth have been taken.

According to this article, 1,653 commercial aircraft wer built in 1927, as against 636 in 1926, or an increase of 16 per cent. Including military machines, the total for 1927 i put at about 2,350 machines, against 1,186 for 1926, makin an increase of 98.4 per cent.

At the end of 1927 there were 103 aeroplane manufacturin plants in the U.S., against 67 at the end of 1926. Geographically, these were rather curiously distributed, Californi with 21 and New York with 14 heading the list in 1927 wit the largest number of factories, and Ohio with 460 and Kansas with 272 heading the list with the number of commercia machines produced.

The two firms with the largest output of civil machines i 1927 were the Advance Aircraft Co., Troy, Ohio, with 45 machines, and the Alexander Aircraft Co., Denver, Colorado with 206 machines, all commercial. The Advance Aircra Co. at the end of the year was producing three machines pe day, or at twice the rate of the year's average.

Of nine established aero-engine manufacturers five produced engines mainly for the U.S. Government. Two o these five (Wright and Pratt and Whitney) also supplie engines for commercial machines. So far as can be discovered the only new engines of American make supplie for commercial service in any quantity are of the Wrigh Whirlwind type. The total number of engines produced o civil orders during the year was about 540—all air-cooled.

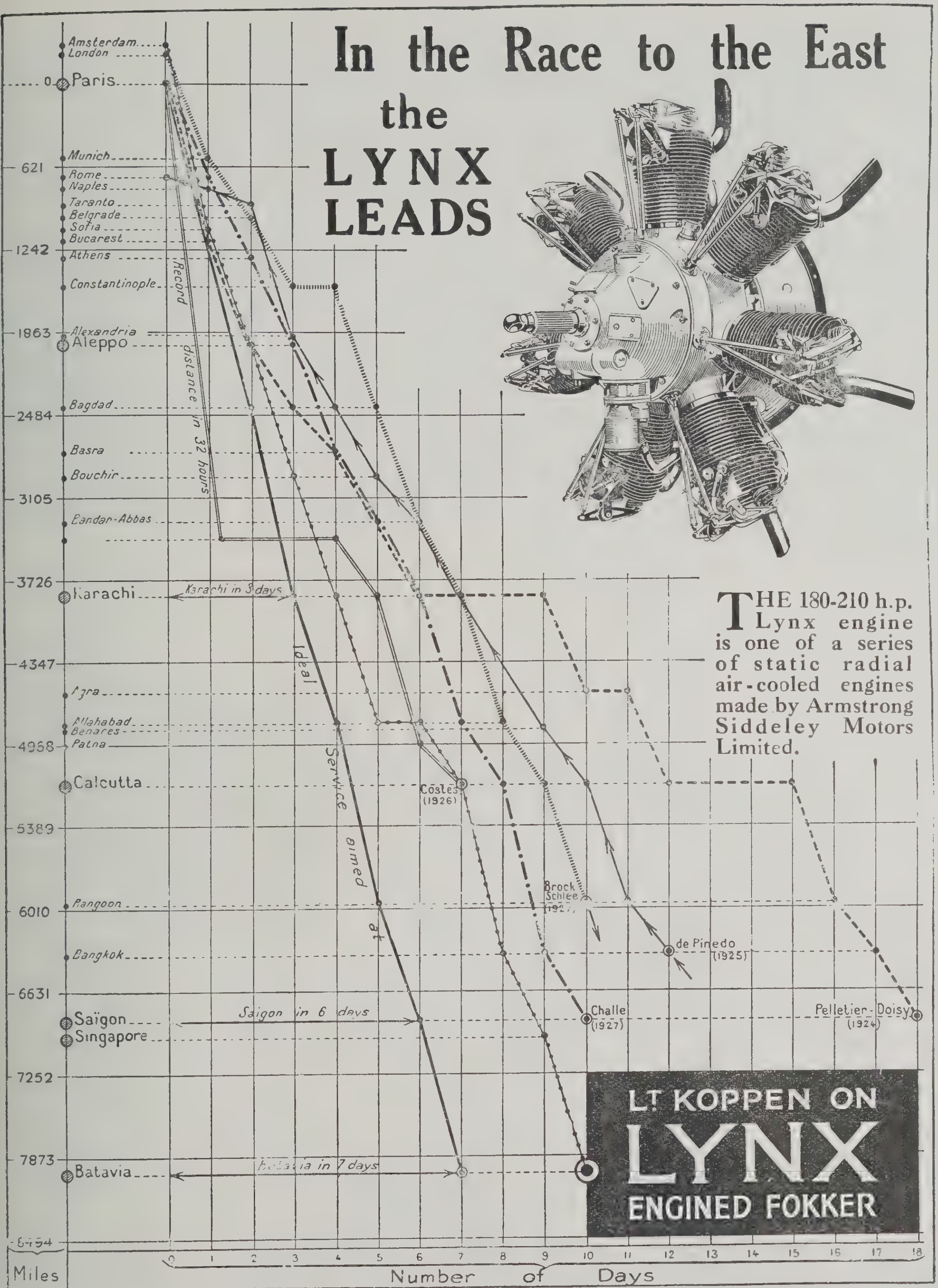
This leaves 1,100 new civil aircraft whose engines are no included in this figure. 1,090 of these are estimated to hav been fitted with Curtiss OX-5 engines, leaving about 25 t be engined by other American surplus engines, and b foreign importation. These last figures are approximate, fo no allowance has been made for machines having more tha one engine. Actually, about 100 European engines are sai to have been imported in the year.

From these figures it is evident that a considerabl majority of the commercial machines produced in 1927 wer of the cheap OX-5-engined type, which sells at prices of fro £400 upwards. These machines can only be built and sol at such a price while stocks of the OX-5 engine remai But these stocks are now nearly exhausted, and man makers of this type of machine have found their outpu seriously curtailed by the difficulty of obtaining engines.

It seems inevitable therefore that in the near future price of this type of aeroplane will have to rise sharply to cove the extra cost of new engines, which must be used whe there are no more OX-5s left. In the article in *Aviation* th opinion is expressed that with this change to new type o engine the performance, detailed design and finish of th American commercial aeroplane will have to be greatly improved.

Complete figures for American exports of aircraft an engines are given for the first eleven months of the yea The total exports of aeroplanes in this period were $720,90 (£150,000 about), of engines $433,345 (£89,000), and of aircraft parts $488,689 (£100,000), making a total of $1,643,12 (£340,000). The bulk of these exports were to Canada an South America.

In the Race to the East the LYNX LEADS



THE 180-210 h.p. Lynx engine is one of a series of static radial air-cooled engines made by Armstrong Siddeley Motors Limited.

LT. KOPPEN ON LYNX ENGINED FOKKER

Adapted from L'Illustration.

ARMSTRONG SIDDELEY
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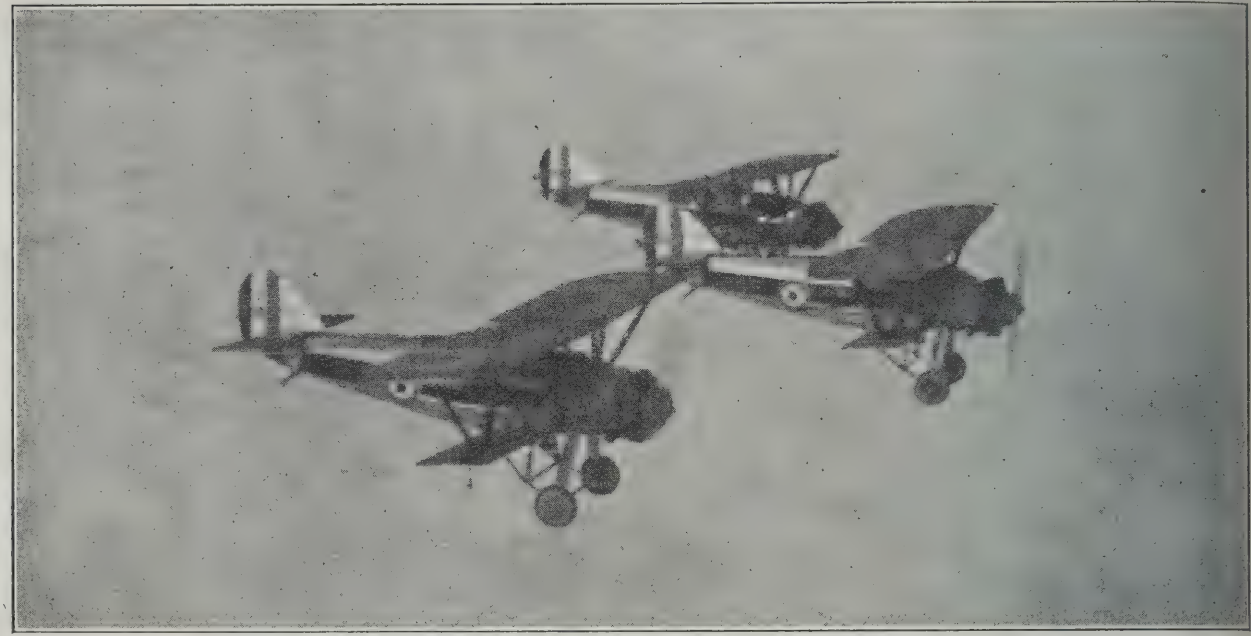
THE ROYAL AIR FORCE.



FIGHTERS.—A Flight of No. 41 (Fighter) Squadron, R.A.F., flying in formation. The No. 41 Squadron is equipped with Siddeley Siskins (super-charged Jaguar engines), is commanded by Sq. Ldr. F. Sowrey, D.S.O., M.C., A.F.C., and is stationed at Northolt, Middlesex.

The London Gazette.

Jan. 10.

General Duties Branch.—Flg. Off. S. F. Coleman is placed on the retired list on account of ill-health (Dec. 31, 1927); Flt. Lt. P. S. Jackson-Taylor is placed on the retired list on account of ill-health and is granted permission to retain the rank of Squadron Leader (Jan. 4); Wing Cdr. W. R. Read, M.C., D.F.C., A.F.C., is placed on the half-pay list, scale B (Dec. 1, 1927).

The following Flg. Offs. are transferred to the Reserve, Class A (Jan. 1):—R. T. Halliwell, C. F. Roupell. The following Flg. Offs. relinquish their S.S. comns. on account of ill-health:—H. E. Milton (Dec. 22, 1927); H. T. R. Cripps (Sec. Lt., Queen's Bays Regt., R.A.R.O.) (Dec. 29, 1927). J. N. Sparks, Lt., R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on return to Naval duty (Jan. 5). The notification in the *Gazette* dated Nov. 29, 1927, regarding Wing Cdr. W. R. Read, M.C., D.F.C., A.F.C., is cancelled.

Accountant Branch.—The following Plt. Offs. on probation are confirmed in rank and promoted to the rank of Flg. Off. (Dec. 4, 1927):—W. S. Calder, J. E. Gregson. Flt. Lt. A. D. Stonehouse is transferred to the Reserve, Class C (Jan. 15) .

Medical Branch.—The following Flg. Offs. are promoted to the rank of Flt. Lt. (Jan. 6):—L. I. Hyder, J. Magner, M.B. Flt. Lt. F. K. Wilson, M.B., is transferred to the Reserve, Class D.II (Jan. 2); Flt. Lt. (Hon. Sq. Ldr.) E. F. N. Currey relinquishes his temp. comn. on completion of service (Nov. 29, 1927); Flg. Off. F. S. S. Whiter is promoted to the rank of Flt. Lt. (Dental) on promotion to Capt. in the Army Dental Corps, with effect from Oct. 17, 1927, and with seniority of Oct. 7, 1927.

Reserve of Air Force Officers.—General Duties Branch.—A. Barron is granted a comn. in Class A as a Plt. Off. (Jan. 10). The following Plt. Offs. are promoted to the rank of Flg. Off. (Jan. 5):—R. E. Hopper, J. F. X. McKenna, E. T. Scott, V. V. W. Vallance. The following are confirmed in rank:—Flg. Off. H. Shaw (Dec. 17, 1927); Plt. Off. R. Bance (Dec. 28, 1927). The following Flg. Offs. are transferred from Class A to Class C:—J. F. Bythell (Nov. 2, 1927); M. H. Aten, D.F.C. (Nov. 26, 1927); C. C K. Dagg, A F.C. (Dec. 23, 1927). Wing Cdr. H. R. Raikes, A.F.C., is transferred from Class B to Class C (Dec. 31, 1927).

Auxiliary Air Force.—General Duties Branch.—No. 600 City of London (Bombing) Squadron.—The following to be Plt. Off.:—A. B. Ferguson (Nov. 1, 1927).

No. 601 County of London (Bombing) Squadron.—The following Plt. Off. to be Flg. Off.:—E. D. W. Reid, M.B. (Nov. 11, 1927). Flt. Lt. H. B. Pett, M.C., resigns his comn. (Jan. 11).

No. 602 City of London (Bombing) Squadron.—Plt. Off. C. A. S. Parker is seconded for a period of one year under para. 62, Auxiliary Air Force Regulations (Dec. 8, 1927).

Appointments.

Week ending Jan. 16.

General Duties Branch.—Wing Commanders B. L. Huskisson, D.S.C., to R.A.F. Depot, Uxbridge, 2/12. H. J. F. Hunter, M.C., to H.M.S. *Hermes*, for duty as Senior Air Force Officer, 3/1. H. R. Busteed, O.B.E., A.F.C., to No. 10 Sqdn., Upper Heyford, to command, 3/1. A. W. Tedder, to R.A.F. Depot, Uxbridge, pending beginning of next course at Imperial Defence College, 19/12 P. C. Maltby, D.S.O., A.F.C., to Air Ministry (Directorate of Training), for Air Staff duties, 19/12.

Squadron Leader H. G. Bowen, M.B.E., to No. 502 Ulster (B) Sqdn., Aldergrove, 1/2.

Flight Lieutenants F. R. Wynne, M.B.E., to No. 32 Sqdn., Kenley, 13/1. A. A. C. Hyde, to No. 10 Sqdn., Upper Heyford, 5/1. A. H. Wann, to Air Ministry (Deputy Directorate of Manning), 6/1. J. Duminy, to R.A.F. Base, Calshot, 6/1. C. Findlay, D.F.C., to E. and W. School, Flowerdown, 30/12. H. C. Pyper, to H.Q., Cranwell, 10/1.

Flying Officers A. R. Feather, to No. 2 F.T.S., Digby, 3/1. G. L. Gandy, to No. 10 Sqdn., Upper Heyford, 5/1. F. W. H. Hall, to No. 26 Sqdn., Catterick, 7/1. R. H. Donkin, to A. and G. School, Eastchurch, 18/1.

Pilot Officers B. W. Figgins, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn., 7/1. The undermentioned Pilot Officers are posted on appointment to Permanent Commissions from the R.A.F. Cadet College, Cranwell, with effect from 17/12:—E. A. Jones, to No. 26 Sqdn., Catterick. K. F. T. Pickles, to No. 100 Sqdn., Bicester. A. W. Hunt and W. H. Hutton, to R.A.F. Base, Calshot. E. R. White and E. J. Hill, to No. 58 Sqdn., Worthy Down. D. J. Waghorn, to No. 17 Sqdn., Upavon. N. A. Tait and S. R. Groom, to No. 12 Sqdn., Andover. G. H. H. Procter, H. C. Parker and J. E. MacCallum, to No. 2 Sqdn., Manston. J. S. Dewar and R. C. Field, to No. 13 Sqdn., Andover. C. E. St. J. Beamish and W. K. Beisiegel, to No. 25 Sqdn., Hawkinge. J. R. H. Pott and H. H. Leech, to No. 43 Sqdn., Tangmere. P. J. H. Halahan, to No. 3 Sqdn., Upavon. J. H. L. Dillon-Trenchard and H. A. Constantine, to No. 56 Sqdn., North Weald. S. L. Blunt, to No. 29 Sqdn., Duxford. N. B. Norris, to No. 4 Sqdn., S. Farnborough. P. J. B. Chalmers, to No. 111 Sqdn., Duxford. J. E. Allen, to No. 9 Sqdn., Manston.

Accountant Branch.—Flying Officer J. L. Armstrong to Superintendent of Reserve, Hendon, 4/1.

Medical Branch.—Flying Officer G. T. O'Brien, Home Aircraft Depot, Henlow, 9/1.

The Hinaidi Accident.

The Air Ministry regrets to announce that as a result of the accident at Hinaidi Aerodrome to a Bristol Fighter machine of No. 6 (Army Co-operation) Squadron, on Jan. 9, Lieut. Sidney Gordon Haserick, the King's Own Yorkshire Light Infantry (attached Iraq Levies), previously reported dangerously injured, died of injuries on the same day.

The Far East Cruise.

The Service flying-boat cruise of four Supermarine Southampton flying-boats (Napier Lion Engines), under the Command of Group Capt H. M. Cave-Browne-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17, flew from Colombo to Trincomalee, Ceylon, on Jan. 12.

The 'Iraq Operations.

The Times correspondent at Basrah in a message dated Jan. 13 states:—

The punitive operations undertaken by 'Iraq against Sheikh Feisal ed Dowish, leader of the Mutai tribe of Wahabis, have begun. R.A.F. squadrons from all over 'Iraq have come south and are making Ur junction their headquarters. Aeroplanes have been distributed to several desert posts, whence a daily search for the raiders continues under the direction of Air Commodore T. C. R. Higgins, Chief of Staff, 'Iraq Command.

I understand that aeroplanes which visited Artawiya found that only women and children remained and that Sheikh Feisal ed Dowish's family had disappeared. The precise whereabouts of Sheikh Feisal is unknown, but the Royal Air Force is confident of finding him, and, in the meantime, it is inflicting punishment on all Akhwan tribes encountered and suspected of supporting Sheikh Feisal ed Dowish. There are rumours that he has been captured by Ibn Saud,

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PITCH PROPELLER

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the Wahabi King, but they are given little credence in responsible circles. The expedition is a purely Royal Air Force undertaking, and the 'Iraqi Army is only providing guards for the machines.

Vacancies for Aircraft Apprentices.

The Air Ministry announces that six hundred aircraft apprentices, between the ages of 15 and 17, are required by the R.A.F. for entry into the Schools of Technical Training at Halton, Bucks, and at Flowerdown, near Winchester. They will be enlisted as the result of an Open Competition and of a Limited Competition held by the Civil Service Commissioners and the Air Ministry respectively. Successful candidates will be required to complete a period of 12 (twelve) years' regular Air Force service from the age of 18, in addition to the training period. At the age of 30 they may return to civil life or may be permitted to re-engage to complete time for pension.

Full information regarding the aircraft apprentice scheme, which offers a good opportunity to well-educated boys of obtaining a three years' apprentice course of a high standard and of following an interesting technical career, can be obtained on application to the R.A.F., Gwydyr House, Whitehall, London, S.W.1.

The principal trades open to boys are metal rigger, a new trade brought into existence by the introduction of the metal aeroplane, which involves training in both fitting and sheet metal work, fitter (aero-engine) and wireless operator-mechanic. The apprentices are given a thorough training in their trade by highly-qualified technical instructors and their general education is also carried on simultaneously by a staff of graduate teachers.

Wing-Commander Hunter.

Wing-Commander H. J. F. Hunter, M.C., whose appointment as Senior Air Officer in H.M.S. *Hermes* is dated Jan. 3, transferred to the R.F.C. from the Rifle Brigade in 1915. He was awarded the Military Cross in 1916 for distinguished service in the field. In 1919 he was appointed to command the School of Army Co-operation, and in 1921 he was appointed to command No. 12 Squadron, British Army of the Rhine. In Sept., 1922, he was posted to H.Q., No. 10 Group, Lee-on-Solent, and in November, 1923, he was posted to the R.A.F. Base, Leuchars.

The Health of the Royal Air Force.

["Report on the Health of the Royal Air Force for 1926." Air Publication 1297. Supplied by The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4. 2s. 8d., post free.]

In submitting his report on the health of the R.A.F. in 1926 to the Air Council, the Director of Medical Services, R.A.F., states that the incidence of sickness, of deaths, and of the number of sick daily was slightly higher than in 1925, but the incidence of invaliding showed an appreciable decrease. A further decrease in the incidence of venereal disease had been effected and the figure was considered highly satisfactory. Eighty-nine per cent. of the officers of the General Duties Branch had been found to be fit for full flying duties at their annual medical examination. Experiments with the flying aptitude apparatus has been made at No. 2 F.T.S., and the results were described.

The report states that the average strength of the total force during 1926 was 32,985, and the total number of cases of disease and injury was 26,422, equivalent to a case incidence of 801.1 per 1,000 of strength compared with 901.1 in 1925. The case incidence at home was lower than in 1925, due to the reduction in the number of cases of influenza. But abroad the sickness incidence was higher, due to the increased number of cases of malaria.

Considering the number of flying accidents in relation to the number of hours flown the casualty risk during 1926 was lower than in previous years. Twenty-nine cases of injury involving two deaths due to airscrews were reported during 1926 as compared with thirty-three in 1925.

A total of 965 cases of injuries sustained in athletics were reported during 1926, an increase of 114 over 1925.

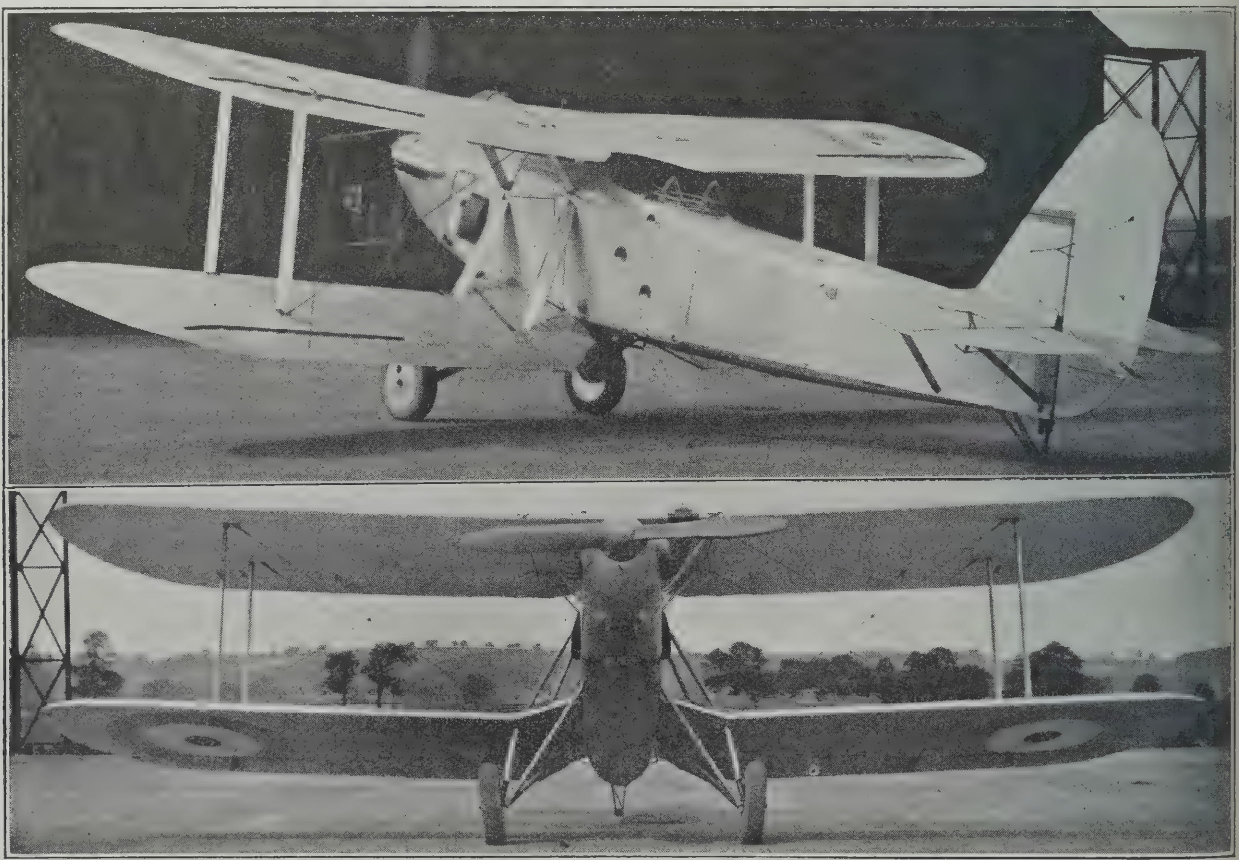
There were seven cases of injury sustained during parachute descents during the year with no fatal results. There were no wounds in action. There were seven cases of attempted suicide resulting in six deaths.

The increase in the incidence of malaria was due to the unusual outbreaks in India and 'Iraq. In India the incidence was the highest recorded in the force. Investigation showed a tendency to slackness in the care of nets, etc. Measures were taken to remedy this. In 'Iraq the increase was due to the after-effects of the floods, pools of water remaining over an enormous area even in the late summer.

There were five deaths from heatstroke in 'Iraq. The P.M.O. in 'Iraq reported that the cases were closely investigated and inquiries gave no indication of any undue exposure or neglect in the observation of the heat regulations.

A summary of the experimental work with the flying aptitude apparatus shows that the apparatus can be of definite value: (i) By assisting in original selection and thereby effecting considerable economies by reducing wastage in *ab initio* training, (ii) By assisting in the earlier elimination of unsound pilots, and thereby effecting economies by further reducing wastage both in training and service units, (iii) By assisting in the actual flying training of pupils.

With reference to the transfer of casualties by air, the re-



THE BLACKBURN RIPON.—Two views of the latest two-seat torpedo-bomber which is in production for the Royal Air Force. It is fitted with a 450 h.p. Napier Lion engine.

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port states that in all R.A.F. commands this form of transport continues to prove of the utmost value in those cases where a rapid means of evacuation, or a journey as free from jarring or movement as possible, is essential. In certain districts the employment of aircraft as ambulances is in very many cases the only means of saving life. Medical officers are flown to the site of the casualty, or cases are collected and brought to hospital. This procedure is routine only in 'Iraq, but it is frequently adopted in India and the Middle East.

The R.A.F. Diary.

The Royal Air Force and British Empire Air Services Diary for 1928 includes most of the information which has appeared in previous issues and a certain amount of new material. A new section, under the heading "The War of 1914-18," gives a *resumé* of the special activities of the Flying Services during the War.

The Light Aeroplane Club Section has been brought up to date and a chart showing approximate mileage covered by the Flying Clubs in Great Britain has been added. The general postal information of previous issues has been supplanted by air-mail information. Other new features are a table of time differences between London and the principal foreign cities, and a table of times of sunrise and sunset and moonrise and moonset at Greenwich, Cape Town, Cairo and Baghdad.

As before, ten per cent. of the published price of every copy sold will be handed to the R.A.F. Memorial Fund.

The Diary may be had from THE AEROPLANE Book Dept., 14, Bream's Buildings, E.C.4, bound in blue cloth 1s. 8d., blue cloth with loop and pencil 2s. 2d., royal blue leather with loop and pencil, 3s. 2d., post free.

R.A.F. SPORTS AND PASTIMES.

The R.A.F. Rugby Football Trial.

The final trial for the R.A.F. representative Rugby team was played at Uxbridge on Jan. 11.

The result of the Trial was the selection of the following players to represent the R.A.F. in their first game of the season against Cambridge University at Cambridge on Jan. 18:—Full back, Flg. Off. T. A. Hale-Munro (Duxford); threequarters, Flg. Off. C. D. Harvey (Worthydown), Flg. Off. F. S. Hodder (Andover), AC. P. B. Coote (Halton), Flg. Off. C. P. Vines (Farnborough); halves, Flg. Off. R. V. Odbert (Captain) (Worthydown) and Sq. Ldr. J. C. Russell (Air Ministry); forwards, Flg. Off. C. J. S. O'Malley (Halton), Sjt. G. F. Cockell (Henlow), Sjt. A. C. Hall (Wittering), Flt. Lt. C. D. Adams (Halton), Plt. Off. H. A. Constantine (North Weald), Cpl. M. G. Christie (Shrewsbury), Flg. Off. G. R. Beamish (Spittlegate), and L-AC. Collins (Bicester). Flt. Lt. J. S. Chick (Wittering) will act as reserve forward or three-quarter.

The Trial was rather a one-sided affair as the Whites, from whom most of the team have been drawn, scored six tries to the two goals of the Colours. At half time the halves and threequarters were changed over to see what the Colours backs could do with a better chance of getting the ball.

The full-back problem seems to have been solved at last. Flg. Off. Hale-Munro played a sound, reliable game and has got back to the excellent form he showed before he was injured in the match against the Navy last year.

The threequarters are suffering from lack of team practice, but they will probably improve after the Cambridge match. Fly. Off. Harvey was not playing in the Trial.

The Worthydown combination of half-backs has been broken up for Sq. Ldr. Russell to play scrum-half where his experience and sound defensive work will strengthen the side considerably.

The forwards looked, in the Trial, to be an exceptionally fast, clever, and hard-working pack, and should give a very good account of themselves. They lasted the game well in spite of the very heavy going on the Depot ground and are all obviously fit.—C. M. MCA.

THE ESPIONAGE CHARGE.

The trial of Wilfred Francis Remington McCartney and Georg Hansen, who are alleged to have been engaged in espionage on behalf of the Soviet Government of Russia, began on Jan. 16 at the Central Criminal Court before the Lord Chief Justice. Among other counts McCartney is charged with attempting to obtain information relating to the R.A.F. and with having obtained information relating to the mechanised force of His Majesty's Army. Both prisoners pleaded "Not Guilty."

The Attorney-General, in the case for the prosecution, said that from March to November of last year McCartney had been actively engaged in the pay of a foreign Power endeavouring to obtain secret information with regard to the safety of this country in order to betray that information to a foreign Power which was employing him. The conspiracy had been unearthed by the patriotic action of Mr. Monkland, a member of Lloyd's, who at once put himself in touch with the responsible authorities. McCartney told Mr. Monkland that he was working for Russia. He had produced a document containing an exhaustive series of questions covering a very wide field of inquiry with regard to the whole organisation, structure, and plans of our Air Force. That document, in the opinion of expert witnesses, could only have been composed by a group of persons very familiar with their subject, such as the war staff of some foreign Power. McCartney had asked Mr. Monkland if he could get answers to the questions which were therein contained, and that if he was able to do so it would be worth a considerable amount of money. He was, in fact, bribing Mr. Monkland to act as a spy for a foreign Power.

After further evidence the trial was adjourned.

A REMINISCENCE.—Two Bristol Fighters of No. 2 (Army Co-operation) Squadron, R.A.F., on the Shanghai Racecourse during the Summer of 1927.

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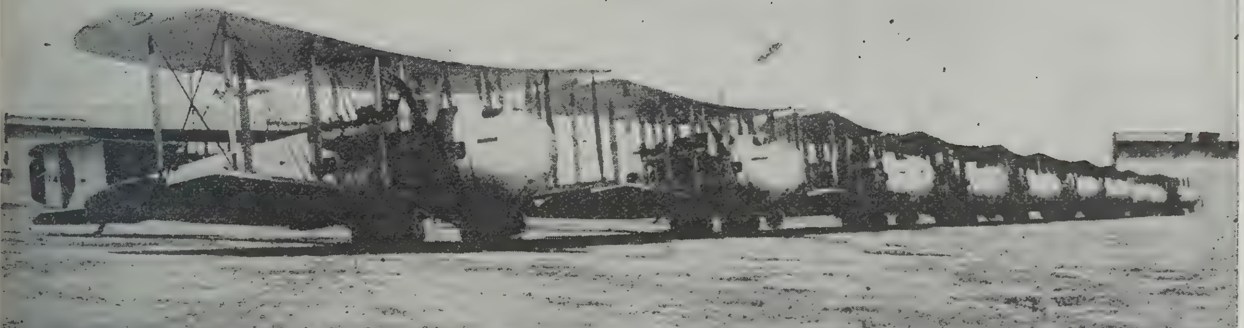

A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph.
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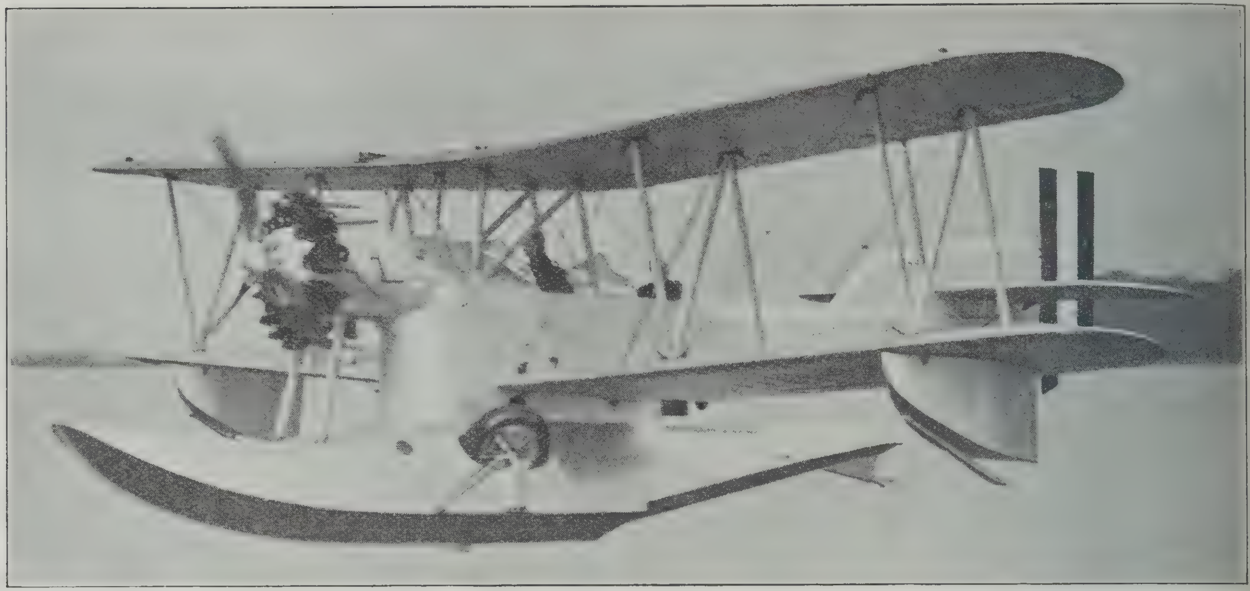


THE U.S. NAVY'S LATEST.—The most recent version of the Loening Amphibian with an air-cooled engine.

THE LOENING OL-8 AMPHIBIAN.

The latest development of the Loening Amphibian known as the type OL-8 has just completed its experimental trials for the U.S. Navy Department. This machine, in accordance with the policy of the Navy to standardise on air-cooled engines, is fitted with the 425 h.p. Pratt and Whitney Wasp engine in place of the inverted water-cooled Liberty or Packard engines previously fitted.

The framework of the hull and fuselage consist of two girders of the Warren-truss type, each built up in one unit, which are cross-connected by bulkheads, which in the case of the hull are solid, thus sub-dividing it up into a series of water-tight compartments. The spruce longerons and diagonals are joined by flat duralumin gusset-plates bolted throughout with duralumin bolts.

The entire covering is of sheet duralumin which is bolted to the wooden frame with a layer of fabric impregnated with bitumastic or marine glue between the wood and metal.

The pilot's cockpit is situated forward under the top wing so that there is good vision for aircraft-carrier landings. Behind the pilot's cockpit is one for the gunner-observer and below, in the hull, is a cabin for the wireless operator.

A wheel control is provided in the front cockpit and a stick control in the rear cockpit. The main fuel tank with a capacity of 140 gallons is directly under the pilot in the hull and a 10-gallon oil tank is behind the engine.

The amphibian undercarriage consists of two frames of triangular form when viewed from the front, which are hinged to the chines of the hull. Each frame carries a wheel and is revolved round its hinge point by a thrust member which operates on a slide tube within the hull. The entire mechanism with the exception of half a wheel is withdrawn into the hull. At the rear of the main section of the hull is a strong tail-skid and under each wing-tip is a float which has a skid.

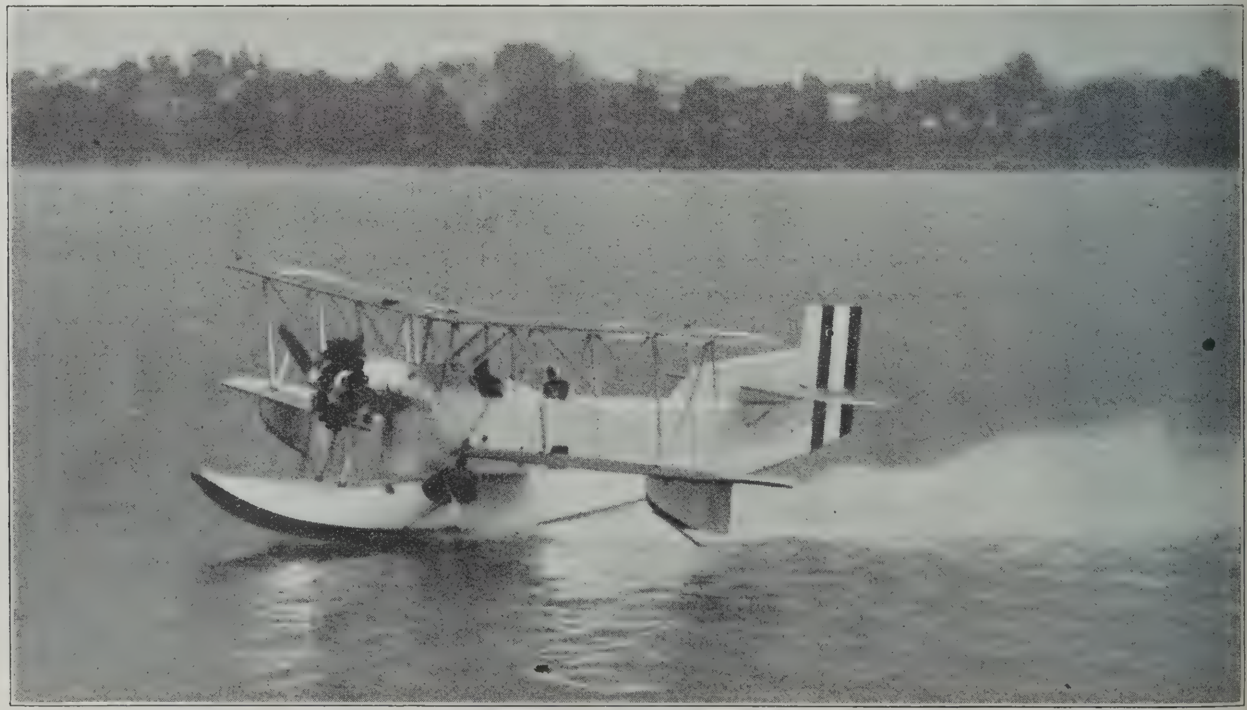
The hull of the OL-8 has been specially reinforced for deck-landing and to withstand the stress of being shot off the U.S. Navy powder-catapult.

The wing construction consists of two spruce spars and duralumin, or the new non-corrosive "Alclad," ribs. On either side of the fuselage are two sets of welded steel-tube "N" interplane struts.

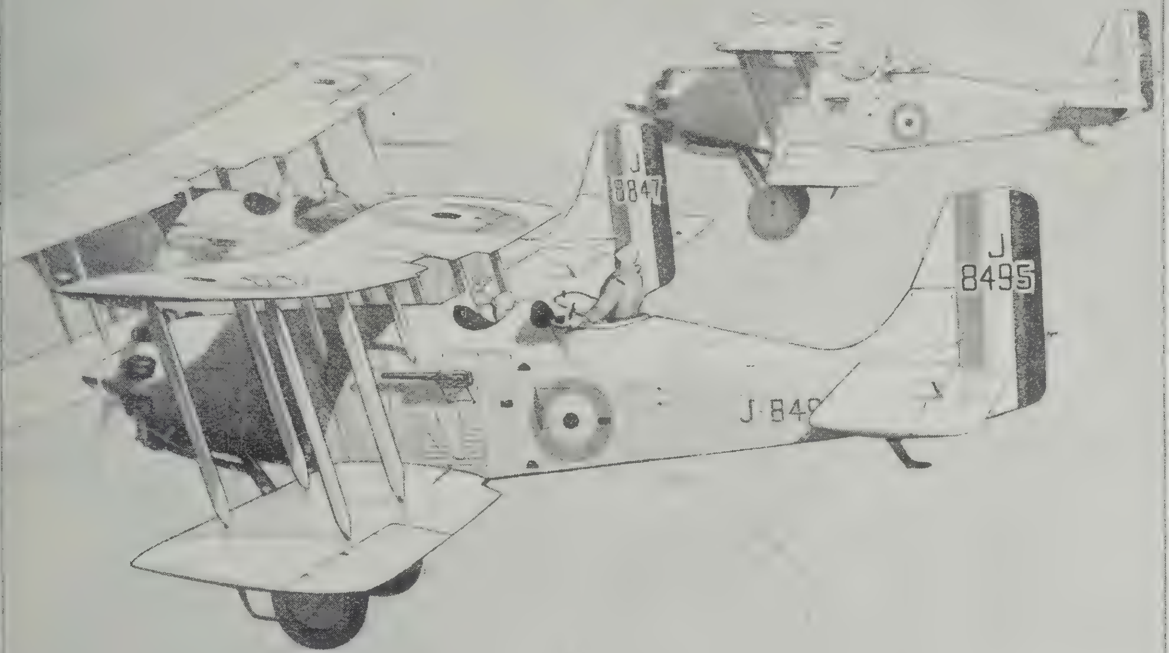
The tail-plane and elevator are of the usual wood and fabric construction but the fin and rudder are metal-covered.

The engine is mounted on a flanged duralumin plate which is connected to the fuselage by steel tubes. It is further braced by two vertical struts which run down to the hull.

The OL-8 has been repeatedly timed to take-off in from 9-10 seconds with full load and is very clean on the water.



THE LOENING OL-8.—A three-seat amphibian (425 h.p. Pratt and Whitney Wasp engine) taking off.



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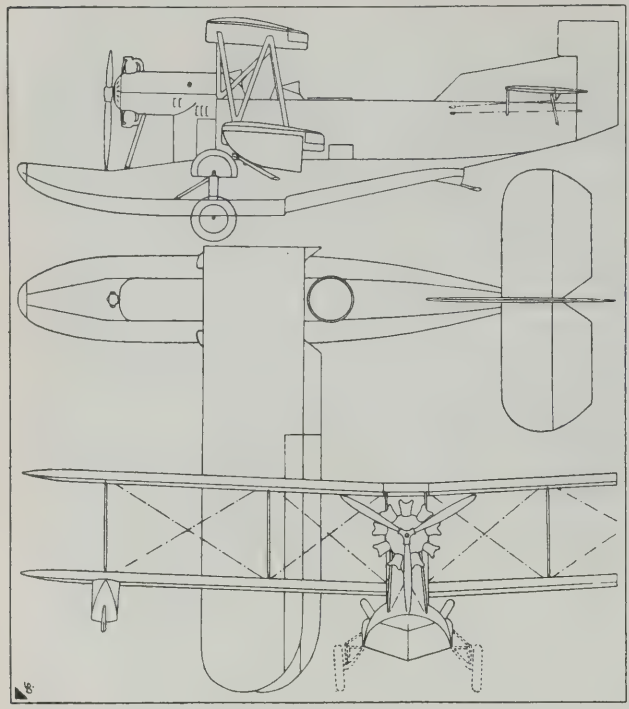


SPECIFICATION.

Span	45 ft. (13.725 m.)	Useful load (Navy catapult)	1,500 lbs. (681 kgs.)
Length	35 ft. 2¾ ins. (10.74 m.)	Weight, loaded, max.	5,253 lbs. (2,384.8 kgs.)
Height:		Speed, max.	124 m.p.h. (198.4 km.p.h).
On wheels	12 ft. 11 in. (3.93 m.)	Speed, stalling	50 m.p.h. (80 km.p.h.)
Wheels up	11 ft. 6 ins. (3.5 m.)	Climb in 10 mins.	5,500 ft. (1,650 m.)
Wing area	502 sq. ft. (46.68 sq. m.)	Service ceiling	13,000 ft. (3,900 m.)
Weight empty	3,253 lbs. (1,476.8 kgs.)	Range at cruising speed	650 miles (1,040 kms.)
Useful load, max.	2,000 lbs. (908 kgs.)		
Useful load (Army normal)	1,800 lbs. (817 kgs.)		

THE KEYSTONE PIRATE.

The Keystone Aircraft Company of Bristol, Pa., formerly known as Huff-Daland Airplanes, Inc., has been awarded a contract by the U.S. Air Corps for 25 LB-5A or Pirate twin-engined bombers.

The LB-5A is a development of the Pegasus single-engined bomber, embodying the most desirable features of the latter type with the substitution of two 420 h.p. Liberty engines for the single 800 h.p. Packard engine.

It is designed to carry 2,000 lbs. of bombs at a cruising radius of about 6 hours with an average speed of at least 100 m.p.h. One of the restrictions imposed in the contract was that the machine should be able to fly on one engine. Successful flying tests were made in 1926, in which it was shown that the Pirate maintained altitude for half-an-hour with either one of its two engines cut out.

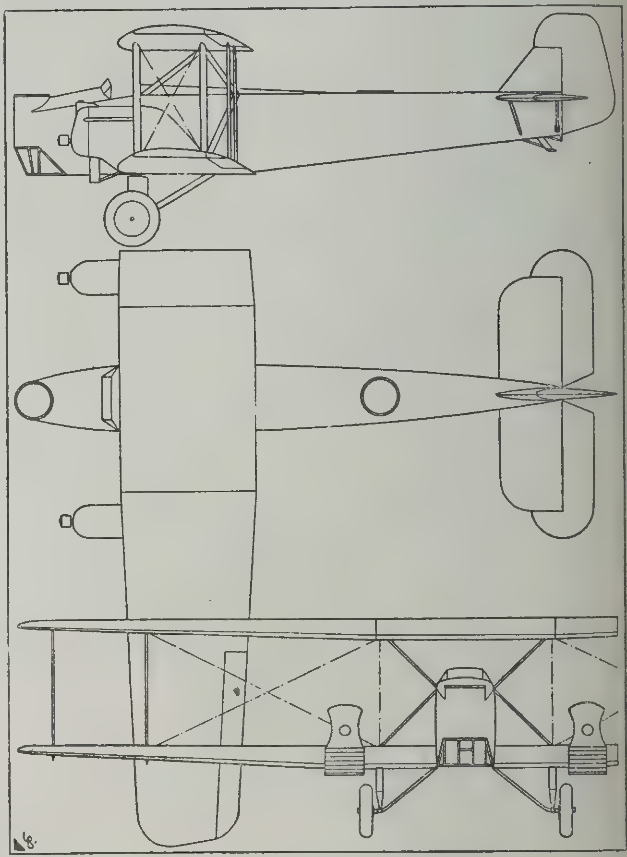
The fuselage conforms to the "Ideal" bombing fuselage lay-out developed by the U.S. Air Corps Experimental Station and has accommodation for a crew of four consisting of pilot, mechanic, gunner and bomber. The fuselage is constructed of welded chrome-molybdenum steel tubing in the form of a Warren truss with no internal wire bracing.

The wings are of wood with plywood box spars and plywood ribs, the whole being fabric-covered.

The undercarriage is of the split type and consists of two Vees, the front legs of which incorporate oleo shock-absorber units, mounted under the bottom planes just inside the wing engines and two bent axles, the inner ends of which are hinged to the bottom longerons of the fuselage.

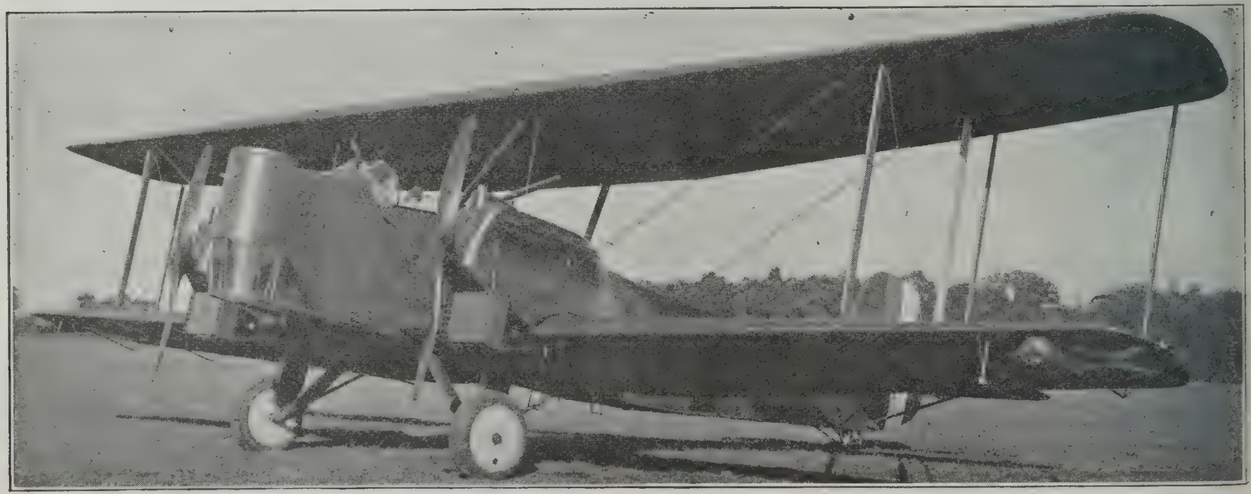
The engine units are mounted direct on the bottom planes without any bracing to the top planes or fuselage.

The tail unit is of the monoplane type with balanced control surfaces. The tail plane is adjustable in flight.



SPECIFICATION.

Span	67 ft. (20.43 m.)	Wing loading	10.3 lbs./sq. ft. (50.28 kgs./sq. m.)
Length	44 ft. 11¾ ins. (13.72 m.)	Power loading	14 lbs./h.p. (6.35 kgs./h.p.)
Height	15 ft. 6½ in. (4.73 m.)	Speed, max.	113.5 m.p.h. (181.6 km.p.h.)
Wing area	1,150 sq. ft. (106.95 sq. m.)	Speed, landing	55 m.p.h. (88 km.p.h.)
Weight empty	6,638 lbs. (3,013.65 kgs.)	Ceiling	13,500 ft. (5,017.5 m.)
Weight loaded	11,800 lbs. (5,357.2 kgs.)		



THE U.S. ARMY'S LATEST.—The Keystone LB-5A bomber (two 420 h.p. Liberty engines).

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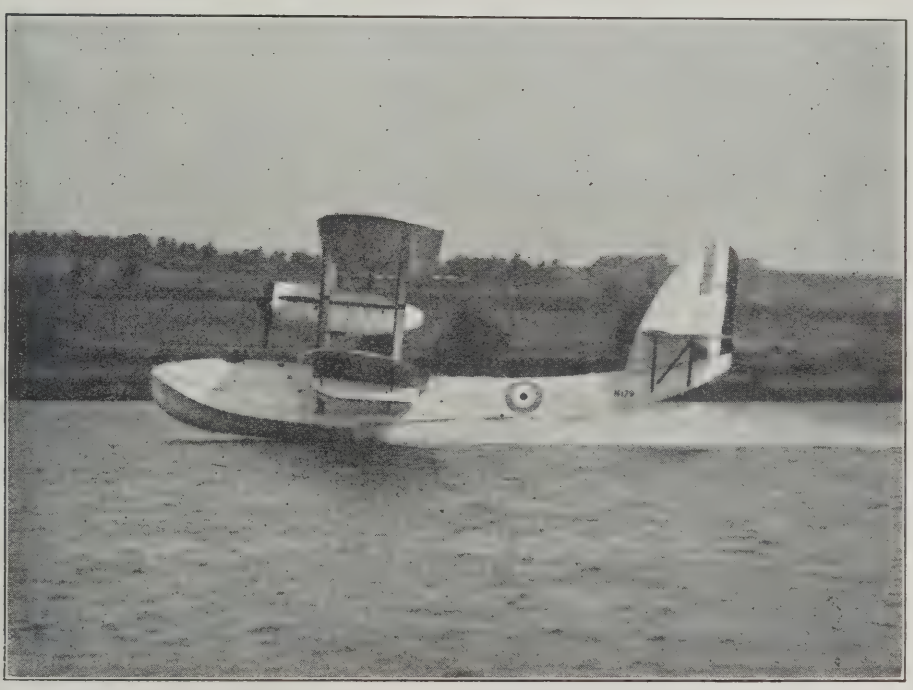

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THE VOYAGE TOWARDS AUSTRALIA.

All concerned with flying will sympathise deeply with Mr. W. N. Lancaster and Mrs. Keith Miller in their mishap at Muntok, and all will be glad to hear that spares for their Avro Avian are being sent out from England, so that they will be able to go on with their journey.

Their effort thoroughly deserves to succeed. They have already done far more than has ever been done by any light aeroplane. Their expedition was started under the greatest difficulties. They were let down badly at the beginning of their organisation by people on whom they relied for co-operation. Mrs. Miller raised the necessary finance by sheer pluck and persistence—and never lost her sense of humour. The flying people at Croydon, where they made their meagre preparations, treated their scheme as a joke and refused to believe that they would get much further than France. But in spite of it all they have made good.

Their ultimate arrival in Australia will be a well-deserved triumph of pluck, pertinacity and sporting spirit.—C. G. G.

SIR ALAN COBHAM'S MISHAP.

Repairs of the Short Singapore being completed, Sir Alan Cobham made satisfactory test flights on Sunday and Monday, Jan. 8 and 9, but unfortunately the machine broke away from moorings early on the morning of Tuesday, Jan. 10, and was driven on the beach in a south-easterly gale.

Damage to the hull seems to have resulted, for it is reported that the machine is being towed to the Dockyard to be hoisted out of the water and examined to discover whether repairs can be made there.

WASHINGTON—MANAGUA.

On Jan. 12 Major L. Bourne, U.S. Marine Corps, left Washington in a Fokker F.VII-3M (three Wright Whirlwind engines) to fly to Managua, Nicaragua, and arrived at Miami, Fla., the same day.

On Jan. 14 he left Miami at 05.31 hours and reached Managua at 17.33 hours.

The machine, together with another of the same type, will be used in Nicaragua by the Marine Corps for the transport of troops, supplies and wounded.

A FRENCH FLIGHT TO AFRICA.

On Dec. 29 three Breguet XIX biplanes (450 h.p. Lorraine-Dietrich engines) piloted by Commandant Gama, Adjudant Cellard and Sergeant Lafranchère, and carrying as passenger M. Proust, a Deputy, M. Poinsot, a Colonial official, and M. Boiteux, a mechanic, left Le Bourget on a flying mission to French West Africa.

On the same day Commandant Gama and Adjudant Cellard reached Perpignan, after stops at Narbonne and Lyon respectively, while Serjt. Lafranchère was held up at Lyon.

On Jan. 4 Commandant Gama reached Agadir from Casablanca.

On Jan. 9, Commandant Gama reached Dakar from Port Etienne.

Commandant Gama and M. Proust have since been reported to have arrived at Niamey on the Niger, their predetermined destination, but no information has been published as to the whereabouts of the remaining two machines.

READ MORE IN 1928.

The Best Technical Books.

ALL THE WORLD'S AIRCRAFT, 1927. C. G. Grey and L. Bridgman. **42s.**
AIRPLANE DESIGN: AERODYNAMICS. E. P. Warner. **37s. 6d.**
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ELEMENTS OF AEROFOIL AND AIRSCREW THEORY. H. Glauert. **14s.**
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THE DEVELOPMENT OF THE SUPERMARINE S5.

At a meeting of the Royal Aeronautical Society, to be held at the Royal Society of Arts, John Street, Adelphi, at 6.30 p.m. Thursday, Jan. 26, the designing of the Supermarine S5, winner of the race for the Schneider Trophy, 1927, will be described.

The lecture will be the joint work of Mr. R. J. Mitchell, of the Supermarine Aviation Works Ltd., the designer of the machine; Capt. A. S. Wilkinson, of D. Napier and Son Ltd., who was responsible for the development of the engine, and Mr. A. P. Ralli, of the Fairey Aviation Co. Ltd., who designed the Fairey metal airscrews used in this race.

Each of these will deal with his own part of the joint work, and their account will be illustrated by lantern-slides and by a cinematograph film.

Admission will be by ticket only, and early application for these is very desirable, as an unusually large number of people will naturally wish to be present. Applications should be addressed to the Secretary, the Royal Aeronautical Society, 7, Albemarle Street, London, W.1.

NATIONALITY BY NATURALISATION.

In an effort to produce an 100 per cent. American aircraft industry it is understood that the U.S. War Department has issued a circular to all foreigners employed in aircraft production that unless they take out naturalisation papers their services will, eventually, be dispensed with. Pending official confirmation of this it is inadvisable to comment on it.

A leading article in one of the United States monthly aviation journals expresses the opinion that the sale of foreign-built aeroplanes assembled in the United States is becoming a real scandal, and suggests that it should be prohibited.

From these statements it would appear that the United States desires to make its aircraft industry truly national by translating foreign possessors of brains and hands employed in that country into true American citizens by means of legal signatures.

CZECHOSLOVAK ANTI-AIRCRAFT TESTS.

Some time ago it was reported in the daily press that the Czechoslovak Army was experimenting with a new pattern anti-aircraft gun.

The experimental tests with this new type gun are being made in the Gulf of Cattaro where a suitable stretch of water together with aircraft accommodation was placed at the disposal of the Czechoslovak Government by the Yugoslav Government.

Four Aero 29 seaplanes (240 h.p. Perun engines) are being used for the tests. Each machine is equipped with a sleeve target which is towed behind the machine on a steel cable at a distance of approximately 600 m. (2,000 ft.)

These tests are apparently still being continued and little information is available beyond the fact that nine targets have been destroyed at a height of 4,000 m. (13,120 ft.).

RUSSIAN AIRCRAFT ENGINES.

According to a report in *Der Flug* the *Nautschnii Auto-Motorin Institut* (Scientific Auto-Motor Institution), a Russian official organisation with a technical staff including Prof. N. R. Brilling, and Dipl. Ing. A. A. Mikulin, has developed two new types of aero-engines.

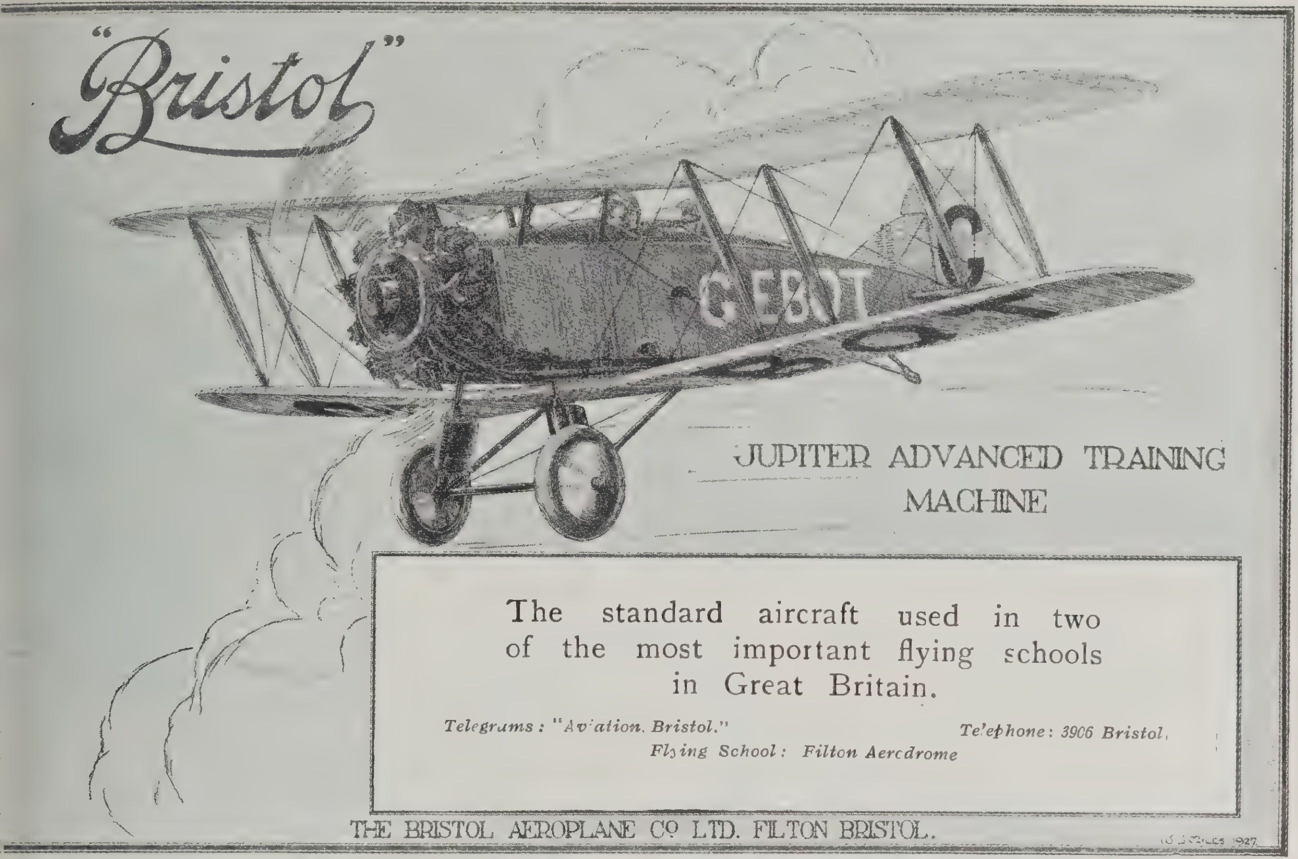
One of these is a five-cylinder air-cooled radial of 100 h.p. No dimensions or data of this engine are given, but from outline drawings it can be gathered that it is of very conventional type.

The cylinders have steel sleeves fitted with light alloy barrels, with which barrels the cylinder-heads are integral.

The other is an eight-cylinder, water-cooled Vee type engine of 400 h.p.

A MODEL EXHIBITION.

On Jan. 16 there was opened at the Royal United Service Institution, Whitehall, S.W.1, a special exhibition of Aircraft Models. Most of these models have been lent by the Department of Overseas Trade. In addition there is on view a very interesting collection of old prints of early ballooning days which have been lent by Mr. J. Hodgson.



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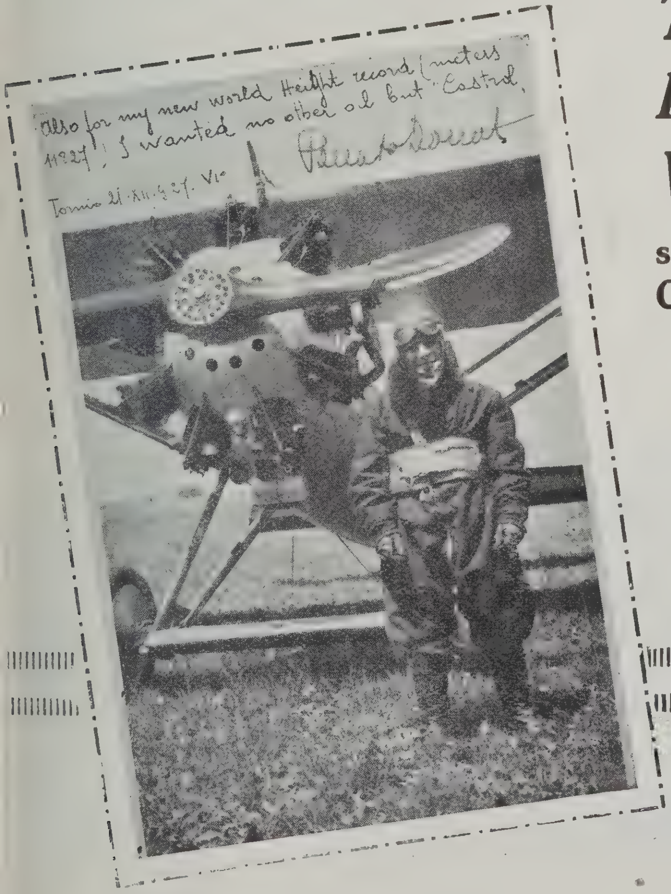

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AMERICA AND THE AIRCRAFT TRADE.

A reader of THE AEROPLANE who is closely in touch with the Press all over the World, and happens to be keenly interested in Aviation, though not in the Trade, writes as follows :—

Your recent remarks about America repeating the motor-car conquest of the World with aircraft are just and timely. I see a great many of the American journals week by week and the matter-of-fact way in which quite unimportant and non-technical papers treat flying, and especially private flying, leaves no doubt as to the essential airmindedness of the U.S.A. Even allowing for the vast population and the huge percentage of people in the "Private-yacht-and-two-big-houses" class, there is a hell of a lot of "airplaning" goes on.

During the Summer too, for experimental reasons I listened every night to the news bulletin (telephony) broadcast on short waves (32 and 22 metres) from General Electric W G Y at Schenectady. Each night there were five or six items of aviation news. The British Broadcasting Corporation with a much bigger and more varied audience mentions aviation about twice a week!

As I see it, the biggest danger of America capturing the World's aircraft market is the matter of finance. Since the motor-car was an infant, America has collected most of Britain's capital. Whereas, with motor-cars, Britain could have easily capitalised real mass-production factories in 1910 (when Walter Chrysler was kicking Buick into a 500-a-day production), to-day the money for vast British production plants would be rather hard to find. But America has money to burn as well as the particular type of mentality which is willing to take a chance with its "siller." And that means victory if things came to a price war.

But that is no earthly reason why our Industry shouldn't make a shot. We might succeed. "Our land's long-suffering star" isn't quite played out yet.

But we shall have to be quick. I don't think there's much doubt that Henry Ford is planning something dramatic. He has lost interest in motor-cars. The new Ford is a strangely uninspired and uninspiring vehicle. It has none of the practical genius of the old Model T and nothing of its amazing adaptability. The Ford motor-car has sunk into line with the general ruck of cheaper American cars. But the point is that Ford is not advertising his car.

Instead, for months past he has been using full pages in *The Saturday Evening Post*—for Aviation propaganda. He wants to convince the Public that Henry Ford and his staff know all there is to know about airplanes. And he's gone about it in the right way, with immense skill and daring.

Now *The Saturday Evening Post* is the World's greatest weekly magazine—not even excepting *Punch*. It has a domestic circulation of 3,000,000 and in addition it goes all over the English—or American-speaking World.

I know several men—India, Gold Coast, Java and Australia, all British born and youngish, who subscribe regularly to *The Saturday Evening Post*. Slowly, insidiously, these men, users perhaps of future Empire Airways, are absorbing—unconsciously—the idea that nobody knows quite so much about airways and aircraft as Henry Ford.

There are probably thousands like them. These people have forgotten the name of Ryan, have forgotten most likely the name Supermarine. But week after week they see an attractive picture of a utility aeroplane, backed up by an able piece of "copy" in which the name Ford is stressed, but not over-stressed. And Ford is going to get a big slice of business.

From which (though perhaps one cannot escape being considered an expert witness) there seems to be a real opportunity for British manufacturers to do a little name-building Press advertising. Possibly it is a case for the S.B.A.C. and a communal campaign. In any case, for a comparatively small outlay it would set the ball of good-will rolling until our 200 h.p. five-seaters are ready.

(Signed) DAVID H. M. SYMON.

The points are well made. But to expect communal action by the S.B.A.C. is too much. If the 20 firms which compose the S.B.A.C. chose to subsidise THE AEROPLANE to the extent of £400 a week (*i.e.*, an average of £20 a week apiece) one would guarantee to convert the World in twelve months to the belief that British Aircraft are the only kind worth considering, provided of course that the British Trade was prepared to deliver the goods which the World's Markets want. But co-operation is the weakest quality in the English nature. So we must just go on as we are, in the knowledge that Competition is good for Trade.—C. G. G.

CURTISS PROPAGANDA IN SOUTH AMERICA.

On Jan. 19 Mr. C. W. Webster, president of the Curtiss Aeroplane Export Corporation, and Lieut. J. W. Doolittle, U.S. Air Corps, are leaving New York for South America in connection with a campaign for the sale of Curtiss aircraft. They are taking with them a Curtiss Hawk single-seat fighter and a Curtiss A-3 two-seat attack and observation biplane.

In Peru they will be joined by Mr. W. McMullen, who has been in Chile for several months instructing the Chilean Air Force in the use of the Curtiss Hawk single-seat fighter, several of which were acquired by Chile last year.

This mission will in six months visit five South American countries, and in the course of the tour it is intended to fly the machines across the Andes from Peru to Bolivia.

THE SYDNEY—WELLINGTON FLIGHT FAILURE.

On Jan. 10 Capt. Hood, Capt. Knight and Lieut. Moncrieff, of the New Zealand Air Force Reserve, left Richmond, near Sydney, N.S.W., at 02.44 hours in a Ryan monoplane (Wright Whirlwind engine) in an attempt to fly non-stop to Wellington, New Zealand.

Several reports were received from many points in the Wellington and Wairarapa districts indicating that the machine was seen on the night of Jan. 10, but no actual trace of it has since been found in spite of the very thorough search that has been made by warships, steamers, and aeroplanes.

Search at sea has been abandoned, but it still continues on land, particularly in the rough country of the Wellington and Wairarapa provinces.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Jan. 15.

Flying Time 12 hr. *Dual Instruction* 4 hr. 30 min. *Solo Flying* 7 hr. *Passenger Flights* 30 min. *Dual Instruction.—With Mr. F. G. M. Sparks*—J. Bickley, A. C. Wigzell, Miss Fletcher, G. E. Clair, H. B. Michlemore, L. Rowson, G. Peckham, W. Cole. *Solo Flying.*—R. Sanders Clark, G. C. Bonner, C. E. Murrell, A. R. Ogston, B. B. Tucker, Sq. Ldr. M. E. A. Wright, C. J. Tapper, L. C. Davey, J. H. Saffery, H. B. Michlemore. *Passenger Flights.—With E. E. Stammers*—Miss Johnson, and G. Joye.

Flying was only possible on Saturday and Sunday last.

The Club has now taken delivery of D.H. Moth G-EBMP to replace G-EBLI, which was crashed in October last.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Jan. 14.

Flying Time 5 hr. 55 min. *Instruction* 1 hr. 50 min. *Solo Flights* 2 hr. 10 min. *Passenger Flights* 1 hr. 45 min. *Tests* 10 min. *Instruction.—With Mr. Brown*—Messrs. Benson and Goss. *With Mr. Cantrill*—Messrs. Harber and Rowley. *Soloists (under instruction).*—Messrs. Browning and Caldecott. *Pilots.*—Messrs. Meads and Rowley. *Passengers.—With Mr. Lacayo*—Messrs. Rowley and Tranton. *With Mr. Brown*—Miss Ruddy, Messrs. A. and A. E. Baerlein. *With Mr. Cantrill*—Mr. Steele. *With Mr. Goodfellow*—Mr. Mills.

Notes.—Real Mancunian weather still prevails and our ground staff is kept busy scraping the fungoid growths off our unserviceable aircraft. Even OK has developed some minor ailment of the engine

MOTHS FOR SPAIN.—On Jan. 13 three D.H. Moths left Stag Lane for Madrid. Two have been purchased by the Royal Aero Club of Spain and the third is for the personal use of the President of the Club, the Duque de Estremera.—(*"Aeroplane" photograph.*)

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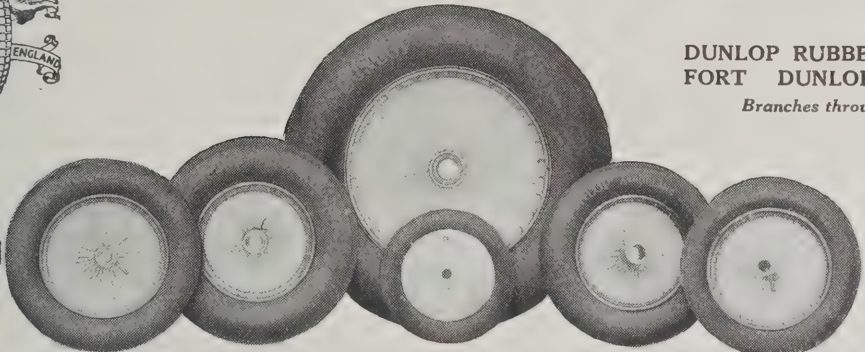

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and only IV (which goes one better in veterariness, or whatever you call it, than the famous IW) continues its solitary way like "the Cat that walked by itself." In view of which it is perhaps as well that we have not been embarrassed by any invitation to send machines over to Hooton on Jan. 28. One gathers unofficially but upon good authority that "the Liverpool Organisation for the advancement of the interests of Liverpool" is upon this date holding some sort of a flying meeting to inaugurate the birth of the Liverpool Flying Club. The many members of this Club who laboured mightily last Autumn at Hooton and elsewhere and who risked their necks and ruined their bank balances to stimulate the air-mindedness of Liverpool and to ensure that the new club should be formed will rejoice that their efforts have born fruit. We wish the prospective club the happiest of omens at its birth, freedom from teething troubles, and an ample supply of prosperous and generous God-parents.

The Newcastle-upon-Tyne Aero Club.

[Sec.: Alex. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for year 1927.

Total Hours Flown 1,136 hr., of which 393 hr. 35 min. was dual instruction, 187 hr. 5 min. solo training and 372 hr. 40 min. flying by Pilot Members holding licence "A."

Twenty-eight members were "launched" solo during the year and 18 obtained their licences.

Except for 20 hrs. flying on a Renault-engined Avro, the whole of the Club's flying has been carried out on two Moths.

One Moth, G-EBQV, has averaged slightly over 2 hr. per day since delivery in April and has not yet required a single replacement. This machine has been flown alternately with Mark I and Mark II Cirrus engines, as the Club owns only one Mark II engine.

QV was purchased to replace LY which was written off in February, the pilot suffering only a broken arm, this being the only accident to a member since the Club began operations. The accident was caused by engine stoppage through water in the petrol system. A modification in the petrol system which has been introduced will prevent such a thing happening again.

Report for week ending Jan. 1.

Flying Time 11 hr. 50 min. *Dual Instruction* 7 hr. 30 min. *Solo Training* 1 hr. *"A" Pilots* 2 hr. 4 min. *Tests* 35 min. *Instruction.—With Mr. Parkinson*—Messrs. V. Heaton, L. Heaton, L. Middleton, J. E. Griffiths, Dickinson, and Dr. Alderton. *Solo (Training)*.—Mr. De Pledge. *"A" Pilots*.—Mr. D. Wilson, Mr. A. Bell, Mrs. Heslop, Mr. C. Thompson, Mr. Baxter Ellis, Mr. F. L. Turnbull. *Passengers.—With Mr. Baxter Ellis*—Mr. P. L. Lawson. *With Mrs. Heslop*—Mr. C. Thompson. *With Mr. C. Thompson*—Mrs. Heslop and Mr. Luckman.

Report for week ending Jan. 8.

Flying Time 8 hr. 15 min. *Instruction* 1 hr. 45 min. *"A" Pilots* 4 hr. 50 min. *Tests* 10 min. *Instruction*.—Miss O. Klyver, Mr. L. Middleton, Mr. J. E. Fairless. *"A" Pilots*.—Mrs. Heslop, Messrs. Leech, Turnbull, R. N. Thompson, C. Thompson, D. Wilson. *Passengers.—With Mrs. Heslop*—Mr. C. Thompson. *With Mr. Leech*—Miss Wilcox, Mr. Southby. *With Mr. C. Thompson*—Mrs. Heslop, Mr. Luckman. *With Mr. F. L. Turnbull*—Mr. R. N. Thompson. *With Mr. R. N. Thompson*—Mr. Turnbull, Mr. Griffiths.

Report for week ending Jan. 15.

Flying Time 5 hr. 40 min. *Instruction* 3 hr. 5 min *Test* 10 min. *"A" Pilots* 2 hr. 25 min. *Instruction*.—Miss Klyver, Messrs. Griffiths, D. Wilson, V. Heaton. *"A" Pilots*.—Miss Leathart, Dr. Dixon, Mr. H. H. Leech, Mr. W. Baxter Ellis, Mr. C. Thompson. *Passengers.—With Mr. C. Thompson*—Mrs. Heslop. *With Mr. Baxter Ellis*—Mr Temple, Mr. Walker.

A gale from Monday evening until Saturday morning prevented any flying taking place during the week, and on Saturday only one flight of 15 minutes in the morning was possible.

On Sunday, Mr. Dudley Watt arrived in the Sopwith Grasshopper, which has been purchased by Miss Leathart.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Jan. 14.

Flying Time 3 hr. 15 min. *Instruction* 1 hr. 5 min. *Soloists* 2 hr. 10 min. *Instruction.—With Mr. Beck*—Messrs. H. Crowther, T. Brown, Critchley, Clayton, Bamford. *Soloists*.—Mr. Critchley. *"A" Pilots*.—Mr. I. Thomson.

Flying has been absolutely impossible the whole of the week owing to one continuous gale which was only broken on Saturday afternoon by a torrential downpour.

Mr. Critchley, one of our most recent members, obliged us with a "Solo" on Sunday in spite of the wind. This is accounted for by the fact that Mr. Critchley although not having flown for nine years, has some two thousand hours' flying time to his credit.

This week we collected RF from Brough with various modifications which are indeed a great improvement. The machine is now fitted with exhaust rings; the tank has gone up into the centre section; the ailerons have been shortened and an adjustable rudder bar fitted. These details have done much to improve the general appearance of the machine.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth, Birmingham.]

Report for week ending Jan. 7.

Flying Time 3 hr. 5 min. *Dual Instruction.—With Mr. McDonough*—Messrs. R. Bednell and A. Fowler. *Solo*.—Messrs. R. Bednell, V. de Satge, S. H. Smith, and E. J. Brighton.

Notes.—Owing to heavy rain and gale one day only was fit for flying.

Report for week ending Jan 14.

Flying Time 6 hr. 6 min. *Dual Instruction.—With Mr. McDonough*—Messrs. E. Wynn and E. Lane. *Solo*.—Messrs. E. J. Brighton, H. J. Willis, W. Swann, R. Bednell, R. Cazalet, S. H. Smith.

Notes.—Owing to heavy rain and high winds only one day was fit for flying.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Jan. 14.

Flying Time 11 hr. 40 min. *Instruction* 5 hr. 10 min. *Solo* 5 hr. 40 min. *Test Flights* 40 min. *Instruction.—With Flt. Lt. Thomson*—Dr. Morrison, Lt. Mandeville, Capt. Kirby, Messrs. Baynes, Storey, Courtney, Dick, Lowe-Wylde, Berney, Musslewhite, Cripps, Watson-Taylor and Fawkes. *Soloists (licensed)*.—Flg. Off. Overbury, Messrs Wyllie, Fagan, Parker, Falconer, Bowen, Cooper and Cripps. *(Unlicensed)*—Capt. Kirby.

The only news to report this week is the holding of the second annual dinner of the Club at the South-Western Hotel, Southampton, on Jan. 13.

The Rev. E. Bruce Cornford, M.A., a vice-president of the Club, presided, and among those present were the Mayor of Southampton (Councillor Mrs. Foster Welch, J.P.), who is also a vice-president, Air Vice-Marshal Sir Sefton Brancker, Brigadier-General P. R. C. Groves, C.B., C.M.G., D.S.O. (Secretary-General of the British Air League), Mr. R. J. Parrott (chairman of the Club), Sq. Cdr. J. Bird, O.B.E., and Mr. A. V. Roe, O.B.E.

Mr. Colebrook, proposing the toast of "The Club," suggested to those people who had not taken any active part in aviation, and who still regarded it, perhaps, as being a little too novel for general acceptance, that just as Southampton in the past built itself on the sea and ships, so the future prosperity of the British Empire was very largely bound up with supremacy in the air. Light aeroplane clubs were doing that work to an amazing degree, and during the last two years these clubs had brought aviation very directly into the homes of a very large number of people.

Mr. Parrott, responding, gave a short account of the Hampshire Club's activities during the past year. The total membership had increased from 136 to 345 during the period from Jan. 1, 1927, to Jan. 1, 1928. There were now 136 flying members and 209 observer and associate members. As to actual flying results, during the year 25 members had been taught to fly and were now capable of taking up a machine alone. About 100 members were at present receiving instruction and had reached varying degrees of proficiency. The total number of hours flown during the year was 700, representing a distance of over 50,000 miles. During this period no member sustained any injury.

Their flying stock still consisted of two Moths, but he was pleased to be able to announce that the Club was acquiring an Avro Avian in addition. Mr. Parrott announced, in conclusion, that the Club's instructor, Capt. Thomson, had resigned his position and was leaving at the end of the present month. He was sure they could not have had a more conscientious and capable instructor, and his departure would be greatly felt. On behalf of the members he took the opportunity of thanking him for all he had done for them and to wish him every success in the future.

The Norfolk and Norwich Aero Club.

[Sec.: H O. Bennett, 5, Opie Street, Norwich.]

Report for week ending Jan. 15.

Flying Time 6 hr. 30 min. *Instruction.—With Mr. Lines*—Messrs. N. Brett, R. Potter, D. Woolfe, G. W. Barker, G. F. Sturtees, H. Mack. *Soloists*.—Messrs. W. A. Ramsey, W. P. Cubitt, H. Pank, F. Gough. *Passengers*.—Messrs. H. Varden-Smith, L. J. Ward, L. Ottaway.

Notes.—Our membership increases very satisfactorily, but if certain thoughtless Soloists would refrain from housetop- and hedge- hopping over Norwich and its immediate vicinity on Sundays (above all days) our membership would increase still more.

Such selfishness on the part of the lesser always reflects unfavourably upon the greater.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Jan. 15.

Flying Time 8 hr. *Instruction.—With Mr. Lowdell*—Miss Edwards, H. Billinton, R. Brown, F. Verney, T. Marriage. *With Mr. Prentice*—F. Verney. *Passengers.—With Mr. Lowdell*—Mrs. Howard, Miss Ambrose, Mrs. Anderson, B. F. Marriage. *With Mr. Prentice*—Miss Rygate, Mr. Collison, Mr. Orris.

The Bristol and Wessex Aeroplane Club.

[Sec.: Col. G. Flemming, O.B.E., M.C., Filton Aerodrome, Bristol.]

Report for week ending Jan. 14.

Flying Time 12 hr. 30 min. *Instruction* 6 hr. 45 min. *Soloists* 5 hr. 15 min. *Passengers* 30 min. *Instruction.—With Mr. E. B. W. Bartlett*—Miss H. Pitman, Messrs. A. E. Arnold, P. H. H. Bryan, A. H. Downes-Shaw, T. H. Clarke, J. H. Roberts, R. A. Hall, H. A. Tiarks, H. F. Tiarks. *"A" Pilots*.—Messrs. A. H. Downes-Shaw, R. A. Hall, E. Hopper, J. E. Tratman. *Soloists under Instruction*.—Mr. J. H. Roberts. *Passenger.—With Mr. Tratman*—Mr. Machon.

The Tees-Side Aero Club.

[Joint Hon. Secs.: Flg. Off. J. Ogilvie and Mr. Harry W. Moss, County Bank Chambers, Middlesbrough.]

At a committee meeting held on Jan. 5 the President (Dr. T. M. Body) said: "The response to our appeal for funds had been very disappointing. Few people had really grasped the significance of the latest developments of aviation, but I am sure that the matter is one of supreme moment. It vitally concerns Middlesbrough's future, and I hope that our civic heads will have sufficient foresight to see this. We must realise at the outset that with civil flying are bound up the interests and commercial prosperity of the town."

It was intended that the Corporation should purchase a field of [illegible] acres or so, as near as possible to the business centres of the town, and lease it to the Club. The Middlesbrough Corporation have appointed a sub-committee to go into the matter.

A set of rules, which had been drafted last December, were considered and passed. It was decided to continue the appeals for help, as it is only the necessary capital that is holding up progress.

A Liverpool Flying Club.

On Jan. 26 a public meeting will be held in Liverpool for the purpose of forming a Merseyside Flying Club. Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation, will be present at the meeting.

It is understood that the Club has been offered the use of Hooton aerodrome, which was used during the War by the American Contingent. It is now in use as a polo ground but it still retains its former aerodrome equipment.

Extract from "The Times," 16-12-27.

FAR EAST FLIGHT AT BOMBAY.

BOMBAY, Dec. 15.—The four R.A.F. Supermarine flying-boats, under the command of Group Captain Cave-Browne-Cave, which left Plymouth on October 17 on a flight to India, Austra ia, and the Far East, arrived here from Karachi to-day. They covered the 560 miles in seven hours.

Air Vice-Marshal Sir Geoffrey Salmond, A.O.C. Royal Air Force, India, who flew in one of the machines, described the flight as one of the most perfect he had ever made.—*Reuter.*

TOTAL DISTANCE COVERED TO BOMBAY 5,560 MILES. TOTAL MACHINE MILES TO DATE, 22,240 MILES.

THIS CONSTITUTES A NEW FLYING BOAT RECORD.

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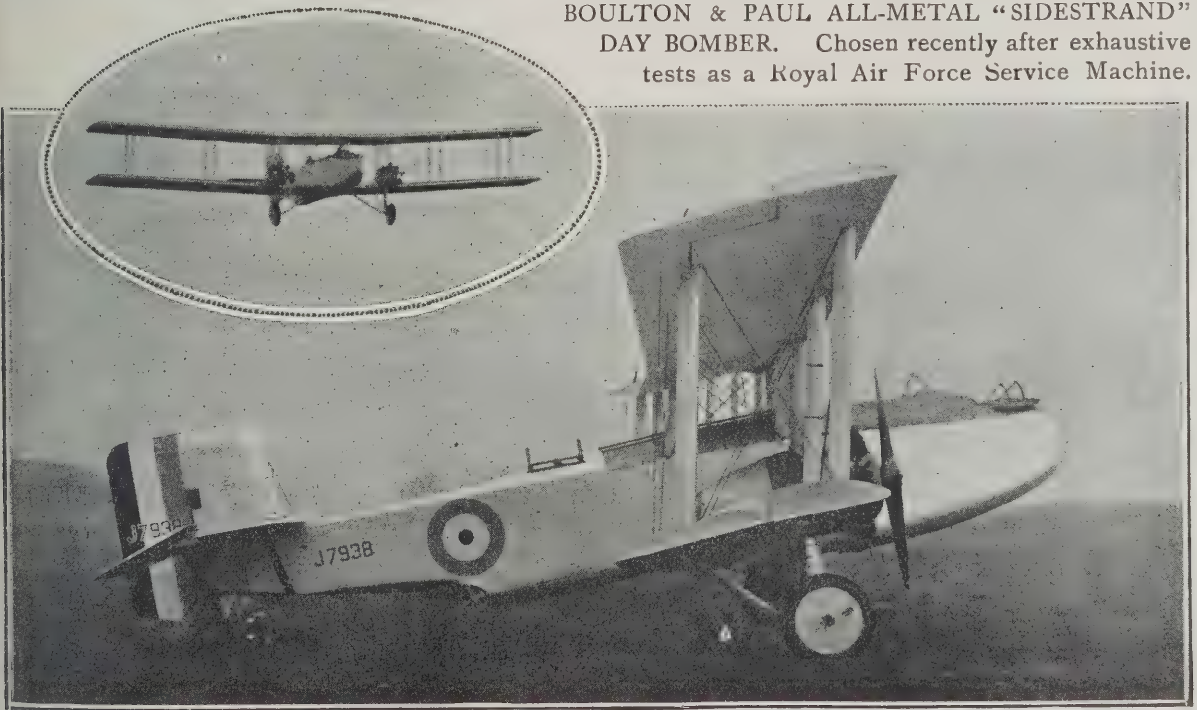

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 18, Tuesday, 14; Wednesday, 14; Thursday, 12; Friday, 19; Saturday, 14; Sunday, 3.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 34, passengers 149, freight 10 tons.

Air Union:
Paris—London: Machines 18, passengers 44, freight 13½ tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 14, passengers 21, freight 2½ tons

Sabena:
Brussels—London: Machines 11, passengers 6.

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 12, passengers 15.

Private:
Machines 5, passengers 3.

Total number of trips by British Machines, 36, carrying 151 passengers. Foreign Machines, 58, carrying 87 passengers.

COMPARATIVE FIGURES.

Week ending Jan. 15:
Machines, 94; Passengers, 238; Crews, 160; Total personnel, 398.
Corresponding week, 1927:
Machines, 67; Passengers, 176; Crews, 108; Total personnel, 284.
Corresponding week, 1926:
Machines, 44; Passengers, 125; Crews, 54; Total personnel, 179.
Corresponding week, 1925:
Machines, 16; Passengers, 17; Crews, 16; Total personnel, 33.
Corresponding week, 1924:
Machines, 45; Passengers, 66; Crews, 70; Total personnel, 136.
Corresponding week, 1923:
Machines, 36; Passengers, 79; Crews, 63; Total personnel, 142.
Corresponding week, 1922:
Machines, 14; Passengers, 14; Crews, 21; Total personnel, 35.
Corresponding week, 1921:
Machines, 15; Passengers, 12; Crews, 17; Total personnel, 29.

Croydon Notes.

That the move to the new buildings will take place at the end of this month still seems quite probable. The new wireless transmitting station on Mitcham Common now has aerials on its masts and is—if not ready—at least nearly ready for tests.

Imperial Airways have already transferred the whole of their stores to the new buildings. As the whole of their workshops are as yet at Plough Lane, considerable inconvenience results from this arrangement, and it can be assumed that these stores would not have been thus transferred unless the removal of workshops was very imminent.

The biggest removal of all, that of Imperial Airways engine shop with its test beds and so forth, has not begun. It will be necessary to accumulate a stock of overhauled engines sufficient to meet any emergency during the period of removal before this move can be started.

Now that the hedges on each side of Plough Lane South of the old building have been removed, a good idea of the size of the enlarged aerodrome can be obtained. At present the ditches have not been filled, nor the lane itself levelled over, so that the extreme East and West run cannot be used, but within a short while this work should be finished.

For the time of year the weather during the past week has been singularly good, and as the traffic returns show, there has not been one single really bad day. On the other hand traffic is at about the bottom of its annual winter slump—a slump which has always occurred at this season of the year and for which no entirely satisfactory explanation has yet been found. This particular slump seems to affect goods as well as passengers, and presumably has something to do with a general slackness in business.

The departure of five private machines from Croydon in one week at this season is distinctly unusual. As it happens the departures themselves are unusually interesting. Two of them consisted of the two D.H.9s flown by Flg. Offs. Vintcent and Newall, which are to propagand and explore commercial possibilities in the East, and the remaining three were the Moths which as recorded elsewhere departed for Spain on Friday to inaugurate an era of private and Club flying in that country.

A YEAR IN THE MIDDLE EAST.

The arrival at Heliopolis (Cairo) of the incoming Imperial Airways machine on Christmas Day, 1927, finished the first complete year of operations on the Cairo—Basrah route.

In that year, between Dec. 27, 1926, and Dec. 25, 1927, ninety-one services each way were completed to schedule, without one single late departure or one forced landing. In addition there have been a large number of special trips, all of them made with the same punctuality and freedom from untoward incident.

The value of the Air Mail service to residents in 'Iraq made itself unusually evident this Christmas. In the ordinary way English papers and magazines reach 'Iraq two and a-half to three weeks after publication, but this year English journals dated Dec. 18 were on sale in Baghdad on Dec. 22.

During December a total of over 6,500 lbs. of mail was carried on the Cairo—Basrah service, and during the last few months the passenger traffic has been increasing at a rate which, if it continues, will entail the duplicating of the present service within a very short time.

IMPERIAL AIRWAYS' WINTER CRUISE.

Imperial Airways announce that to meet the wishes of would-be passengers from America, the date of the Winter Cruise, which was originally to have started from Croydon on Jan. 31, has been postponed to Feb. 27.

There are still a limited number of seats available for this tour, and those who propose to take part in it should apply for them quickly.

ANGLO-GERMAN AIR TRAFFIC AGREEMENT.

The text of the agreement concluded between the British and the German Governments on June 29, 1927, to permit the passage over the territory of each State of commercial aircraft registered in the other State has just been published by H.M. Stationery Office as *Treaty Series No.* 1 (1928), *Agreement between His Majesty in respect of Great Britain and Northern Ireland and the President of the German Reich relating to Air Navigation.*

The terms of this agreement follow very closely those laid down in the International Convention for Air Navigation to govern air traffic between signatories of that Convention. The special agreement with Germany is necessary because Germany is not a signatory to the Convention.

THE AIRSHIP GUARANTEE CO.'S PLANS.

Commander C. D. Burney, who left England for America on Jan. 11, announced before his departure that he was visiting the United States to discuss with American financial interests the plans for the formation of a company to operate a regular Trans-Atlantic Airship Service.

According to Commander Burney his company—The Airship Guarantee Co. Ltd.—intend to exercise the option which they hold under their contract with the Air Ministry to repurchase R.100 from the Ministry as soon as the ship has completed her home trials.

Hopes are expressed that these trials will be over before the end of the coming summer, and it is then intended to run the ship on a series of trans-Atlantic demonstration trips carrying about 50 passengers. If this programme can be carried out Commander Burney believes that there will be no difficulty in floating a new company with a capital of about £7,000,000 to undertake the building of at least five new ships very considerably larger and faster than R.100 for the North American route. Designs for these ships are said already to be in hand.

R.100—which has neither the speed nor the load capacity desirable for the North Atlantic service—would, after making the American demonstration trip, be transferred to the England—Egypt route.

A DURATION RECORD ATTEMPT.

On Jan. 12 Mr. Clarence Chamberlin and Mr. Roger Williams took off from Roosevelt Field in a Bellanca monoplane (Wright Whirlwind engine) in an attempt to beat the World's Duration Record.

After remaining in the air for 51 hours 52 mins. 24 secs.

MALLITE PLYWOOD
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Telegrams: VICPLY KINLAND LONDON.

ey were forced to abandon the attempt through lack of etrol.

They beat the American record established by Messrs. hamberlin and Acosta last April by 41 mins. 4 secs., but iled to beat the World's Record, at present held by Messrs. dzard and Risticz, by 30 mins. 7 secs

A VIENNA AERONAUTICAL EXHIBITION.

The Austrian Aeronautical Society (Oesterreichischen Flug esellschaft) is organising an Aeronautical Exhibition to be ld in Vienna from Feb. 15 to March 15, 1928.

This exhibition will cover every phase of aeronautics, in- uding aircraft, aero-engines, commercial aviation, meteoro- gy, etc.

The Management of the Exhibition, which is known as the iener Luftfahrt Ausstellung, 1928, has its offices at Graben, A, 1 Bezirk, Vienna, to whom all inquiries concerning the hibition should be addressed.

A QUEENSLAND AIR PAGEANT.

On Nov. 12, 1927, the Queensland Section of the Australian ero Club held an Aerial Pageant at Eagle Farm Aerodrome, risbane.

The event attracted a crowd of over 6,000, and the pro- eds of what can be considered as a very successful meeting e to be devoted to the furtherance of the club's activities promoting the interest of aviation in Queensland.

The principal event of the day was known as the Queens- nd Aerial Derby, which combined a handicap race for the Eagle" Cup, and a speed championship for the "Per- iau" Cup, over a course of 45 miles in three triangular laps 15 miles each. The starters were a D.H Moth, a West- nd Widgeon, an Ireland Meteor, a D.H.50a, and a B.E.2E.

The Ireland Meteor (90 h.p. Curtiss Ox-5 engine), flown Mr. Tyler, won the "Eagle" Cup, with the Moth second d the B.E.2E third, only 100 yards behind the Moth.

The Westland Widgeon, flown by Mr. Milton Kent, won e "Perdriau" Cup and speed championship by covering e course of 45 miles in 23 mins. 51 2-5 secs., with the .H.50 second and the D.H. Moth third.

No. 3 Squadron R.A.A.F. sent nine machines, three .H.9as, three D.H.9s, and three S.E.5as, to assist the meet- g, and these machines indulged in formation flying, aerial hting, low altitude bombing, etc.

Mr. L. J. Brain, chief pilot of the Brisbane Flying School, ve a very finished display of aerobatics on a D.H. Moth.

FOR PERSONAL USE.

On Dec. 10 a Loening Amphibian (400 h.p. inverted Liberty gine) was delivered to Bolling Field, Washington, D.C., here it will be maintained for the personal use of the ssistant Secretary of War for Aeronautics, Mr. F. Trubee avison.

The machine is specially fitted to accommodate three per- ns, the Secretary, his pilot, and a secretary or mechanic, gether with a certain amount of baggage.

It will be used by the Secretary for his own personal flying actice as well as inspection flights to the Army Air Corps roughout the United States.

THE INTERNATIONAL LEAGUE OF AVIATORS.

A *Reuter* message from Paris on Jan. 16 states that the tle of Champion Airwoman of the World has been awarded the Hon. Lady Bailey by the Committee of the Inter- tional League of Aviators. Lady Bailey will receive the omen's International Aviation Trophy.

The *Reuter* message also states that the Committee has arded the 1927 International Trophy for men to Colonel harles Lindbergh for his non-stop flight from New York to ris.

A RECORD OF RESEARCH WORK.

[he Technical Report of the Aerodynamical Research Committee for 1925-6. 1,023 pp. Published by H.M. Stationery Office. Price £1 15s. net.]

In this volume there is to be found the formal report of the ronautical Research Committee to the Secretary of State r Air for the year ending Mar. 31, 1926, together with the tual technical reports (generally known as R. and M.s) on e researches carried out in that period so far as these are t available for publication.

The formal report was published as a separate document in e summer of 1926, and all the technical reports contained this volume have also been published as separate units, and e volume therefore contains nothing new.

But the collected and bound volume does present in a handy d convenient form a vast amount of technical data other- se only to be found by searching through the files of the lated R. and M.s. As it has an excellent index it has rtain obvious advantages for purposes of reference.

To all my flying friends I say-

"meet Ethyl!" Tommy Prattkins

Winner of the Schneider Cup, and holder of the Tiger Moth, and other famous records.

Pratts
Ethyl Petrol

LOOK FOR THIS SIGN

D.A. 90.

A CURRENT RECORD.

Those who would like to have a pictorial record of Service aircraft of to-day, comparable in a way with Capt. Saundby's *Flying Colours,* which had such a vogue towards the end of the War, will find much of interest in *White Wings,* just published by The Aircraft and General Fine Art Co., of East Grinstead, Sussex.

The twelve pictures, large and small, which compose the volume, are excellently reproduced in colours, and include practically every modern type used by the R.A.F. It is quite good value at 7s. 6d., if only for purposes of record, apart from its high decorative value.

THE GLOSTER MAGAZINE.

It has come to the knowledge of the Gloster Aircraft Co. Ltd. that a great many readers of that excellent magazine, *The Gloster,* did not receive their Christmas Number, or received only the wrapper, due possibly to the magazine having been sent out during the Christmas post rush. If any of these unfortunate people care to communicate with the London Office of the Gloster Company, at 5, Grafton Street, Bond Street, the firm will be very pleased to make good their loss.

NEW COMPANY.

Lancashire School of Aviation Ltd.—Private Co. Registered Jan. 13. Capital, £2,500 in £1 shares. Objects: To establish and carry on a school of aviation. The subscribers are: E. G. Clerk, 8, Beach Street, Lytham, Lancs., gent. C. B. Harris, 8, Beach Street, Lytham, Lancs., gent. E. G. Clerk signs as managing director and secretary. Qualification: 1 share. Solicitors: A. F. and R. W. Tweedie, 5, Lincoln's Inn Fields, W.C.2. Registered office: 8, Beach Street, Lytham, Lancs.

PERSONAL NOTICES.

Marriage.

RUSSELL—KINGDON.—On Dec. 22, at the Cathedral, Bombay, Flt. Lt. B. H. C. Russell, R.A.F., to Elizabeth Mary, youngest daughter of the Rev. H. N. and Mrs. Kingdon, Springfield, Stockbridge, Hants.

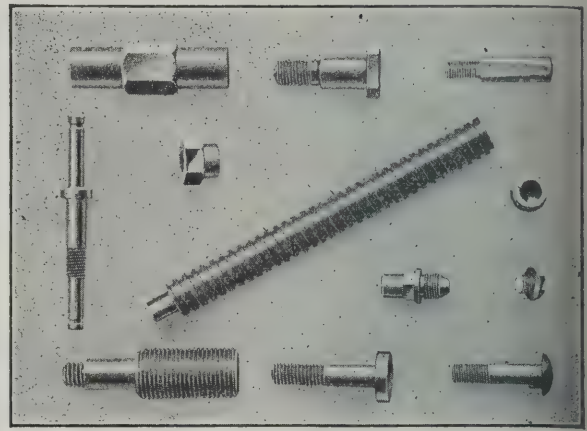
Forthcoming Marriage.

MURRAY—CLOUSTON.—The engagement is announced between Lee Murray, R.A.F., younger son of Dr. Hugh L. Murray, of Melbourne, and Nancy, younger daughter of Mr. and Mrs. Harold Clouston, 33, St. Mary's Road, Wimbledon.

Birth.

BETT.—On Jan. 12, to the wife of P. J. Bett, R.A.F.—a daughter.

REPETITION PARTS.
THE PARTS WE MAKE CAN BE RELIED UPON.



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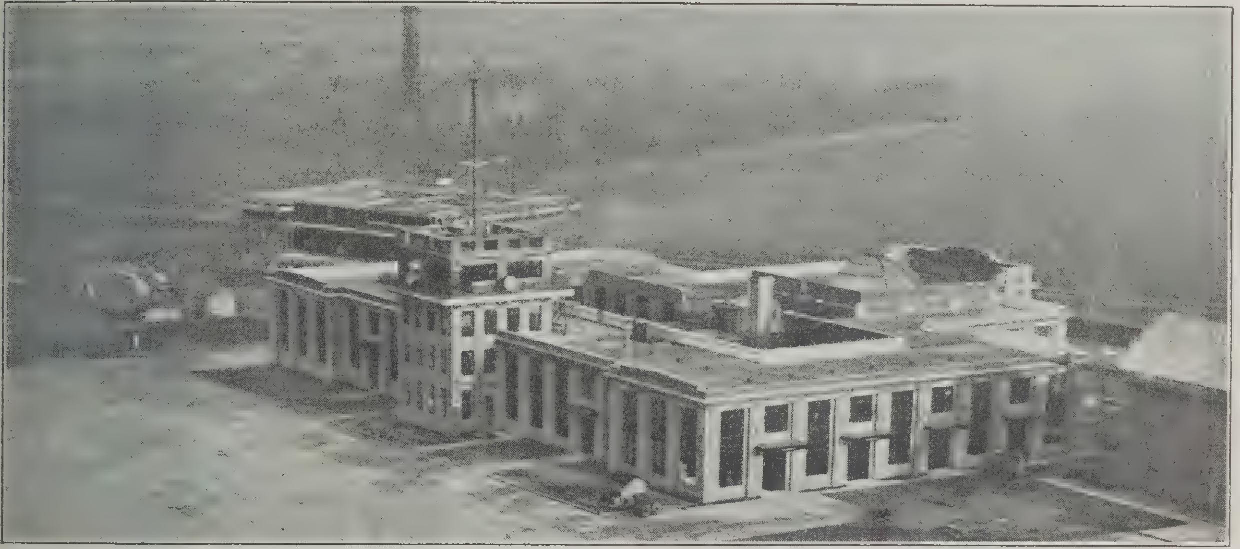
FOREIGN TRADE.

THE AEROPLANE
INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

FEB 13 1928
UNIVERSITY OF ILLINOIS

Vol. XXXIV. No. 4. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"A NOBLE CRAFT, THAT OF A MASON!"—(*Carlyle.*)



(*"Aeroplane" photograph.*)

THE AIR PORT OF LONDON:—The new administrative buildings at Croydon. The square tower in front of the building has at its top the control room and the directional-wireless aerial. The glass dome at the back of the buildings is the roof of the main passenger-hall.

AERODROME WIRELESS

Every modern aerodrome handling or controlling commercial, civil, or military aircraft traffic needs the best wireless equipment available.

Croydon, the London Air Port, is being equipped with four 3 K.W. wireless transmitters and a direction finding receiver—the most complete and up-to-date wireless installation in any European civil aerodrome. All the apparatus is Marconi's.

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It is ideal for the owner pilot and the Flying Club.

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JAN. 25, 1928.

THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 4.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
U.S.A., 1 Year, $8.50c.

ON GETTING AND KEEPING FOREIGN TRADE.

According to the best judges (on paper) England is going have a Trade Boom for the next few years. That seems uite likely. The business chart of the World, so far as it oes back, shows alternately a regular swing of the pendu- im between a boom in England with a slump in America nd a boom in America with a slump in England. America as had a very fine trade boom during the past ten years nd has accumulated practically all the loose gold in the orld. But for some curious reason, in spite of that, the nglish pound sterling stands above par in exchange with e American dollar. Which seems to show that in spite all our lamentations about bad trade and our masses of nemployed and so forth, England's commercial credit is ill the best in the World.

Social agitators of all kinds make a great song about the umber of our unemployed, but those who have experienced ctory conditions know quite well that only in conditions extreme trade boom could the majority of our million un- nployed be employed at all. Probably a quarter of a million them anyhow are genuine unemployables, physically or entally useless for any kind of work. Probably another arter of a million are people who can never hold down a b because they are always quarrelling with authority and ing dismissed. And probably the other half million are ople who can never quite pull their weight in a factory at dinary prices, but may be worth employing when prices e high.

If one takes our population as being about forty million, out twenty million of those are of employable age, neither o old nor too young for work. And if one took twenty en and women haphazard off the street one would be sur- ised if nineteen of them turned out worth the money one ould be asked to pay them. The only thing that is harder find than a job when one is out of work is to find man or woman capable of doing a job properly when there i a job open.

Therefore a mere million unemployed rather seems to in- cate that Trade in this country must be pretty good as it i And certainly the more one sees of other countries e more one is convinced that even to-day the Englishman all classes is better housed, better fed, better paid (for at he can buy with the money) and better amused than ybody else in the World,—including the inhabitants of the nited States. Consequently, if and when we do have a ade boom this country ought to be a very pleasant place hile the boom lasts.

FOREIGN MARKETS AND A HOME BOOM.

Naturally a trade boom in this country can only come rough an increase in our foreign trade. We cannot get rich by taking in one another's washing. Therefore one hopes that when the boom in exports begins in other trades and people in this country begin to make money and spend it freely, the British Aircraft Industry will not lose sight of the value of foreign trade in aircraft in spite of the temptation to grab a few pounds by selling machines to people in this country who are making money out of foreign trade in their own line of business.

If people in the Trade adopt that short-sighted policy they will find that while they are busy filling up a strictly limited home market, the market in our Overseas Dominions and in foreign countries will be captured by the American Aircraft Industry, which by that time will be suffering badly from over-production and will be dumping its products outside the United States at less than cost price in precisely the same way that it has dumped bicycles, motor-cars, sewing machines, agricultural implements, boots, watches, and practically every other kind of manufactured article in the past.

Some idea of what may be expected in this way is disclosed in a letter from a friend in America who is particularly closely in touch with the output of the American Aircraft Industry. One commends a study of his figures to the Air Ministry, the Society of British Aircraft Constructors and the Department of Overseas Trade.

He states that during the year 1926 about 1,200 airplanes of all descriptions, military and commercial, were manufactured in the United States. During the year 1927 he estimates that 3,000 airplanes were manufactured, the largest increase being in the commercial type, for neither the U.S. Air Corps nor the U.S. Navy ordered machines in anything like large quantities, and the export of American aircraft has practically been limited to a few war machines bought by Chile. The rest of that enormous output, judged by our standpoint over here, has been entirely absorbed by ordinary private and commercial users in the States.

His forecast for 1928 is an output of 6,000 airplanes, which he judges from the rapidly growing commercial demand. He says that approximately 1,000 air-ports have been completed or are in process of construction in the United States to-day. And he argues, quite reasonably, on a basis of only six new airplanes for each air-port, which would not be a very heavy distribution. Which looks as if the forecast for 1928 will be realised.

DUMPING SURPLUS OUTPUT.

That is all very well for 1928. But if the American Aircraft Industry turns out 6,000 airplanes in 1928, knowing the manners and customs of American manufacturers, one may safely forecast an output of something over 12,000 airplanes for 1929. And if that output happens to coincide with

A FOKKER UNIVERSAL (Wright Whirlwind engine) which is one of the most widely used of the smaller type of commercial aircraft in America. Many are in use in Canada.

a financial slump in the States, most of it is going to be dumped in the British Empire for practically any price it will fetch.

Now if that dumping coincides with a boom in aircraft here and we neglect our overseas markets to satisfy the home demands, America is going to get those markets even if by that time we have awakened so far as to build the type of machine that is wanted in those markets.

One has a very clear recollection of the great cycle boom of 1896-97. At that time one was a bad draughtsman in Coventry. The firm on which one was inflicted had built up a very fine trade on the Continent of Europe and in Australia and South Africa, with special types of bicycles built according to overseas demands,—after the usual years of trying to sell overseas buyers what *we* made instead of what *they* wanted.

During that period of Home Boom the Management used to dash about the Packing Department day after day cutting the labels off hundreds of machines ready for despatch to foreign buyers and replacing them with labels for agents in the British Isles. Within two years the British market was full to the bung, we had lost nearly all our foreign trade, which was promptly captured by dumped American machines, our stock rooms were full of unsaleable machines, and we hit a most disastrous slump.

One hopes therefore that the British Aircraft Industry will learn a lesson from that experience, so that when our trade boom does come our aircraft firms will meet it by increased output and will spend a goodly part of the profits in strengthening our hold on the Overseas Markets.

Meantime, pending the arrival of the Boom, let us consider what can be done in the way of getting those Overseas Markets. For we will do well to remember that though we may capture the markets of the British Dominions with commercial aeroplanes, there is bigger business to be done with foreign nations in war machines.

TREASURY OBSTRUCTION.

One of the chief hindrances to foreign trade in this country is undoubtedly the British Treasury. Naturally the job of the Treasury is to collect all the money it can in taxes and to cut down all unnecessary expenditure. But unfortunately it insists on working along such cut-and-dried lines and shows so little intelligence in its methods, that it actually ends by depriving itself of money. A few examples may serve to show how.—

One outstanding example affects the Shipbuilding Industry. Until two or three years ago the Argentine Government maintained in Europe a Naval Commission, the headquarters of which were in London. And from here the members of the Commission visited various foreign countries and bought there only what they could not get in England.

A change was made in the personnel of the Commission. Admiral Galindez complete with Staff came to London to consider the purchase of Naval material, for which the Argentine Government had voted nearly twenty million pounds sterling. Almost the first British Government official to call on the Admiral was a representative of the Income Tax Department who asked him and his Staff to fill up the necessary forms for taxation while resident in England. Quite naturally the Admiral considered that he and his Staff were entitled to diplomatic privilege in such matters, though not actually members of the Argentine Legation.

There was considerable argument on the subject, and after discussing the matter with members of other Latin-American Commissions in London a general protest was sent to the Treasury Authorities, who refused to budge from their position. Ultimately a well-known diplomatist who had been in London for some considerable time unearthed a document which had been sent to the Argentine Legation twenty years or so before, granting diplomatic immunity against taxation to that class of official visitor.

The circumstances were brought to the notice of the Department of Overseas Trade as well as to prominent members of the Government, and the matter was properly adjusted in due course. But unfortunately, "due course" was just about six months too late to be of any use to British shipbuilding.

ITALY'S BENEFIT.

By that time Admiral Galindez and his Staff had withdrawn from London and had made their headquarters in Genoa. The result is that the Argentine Navy has now ordered a couple of cruisers and three submarines from Italy, has bought a couple of second-hand destroyers from Spain and some sloops from France, and all that the British shipyards have got are orders for two flotilla leaders from Samuel White's of Cowes, because they have the monopoly of that type of ship. And one believes that a couple of tugs have also been bought in England. That is to say, at the most moderate estimate, British shipbuilding has lost something like £15,000,000 worth of orders simply because the Treasury insisted on trying to grasp a few thousand pounds worth of taxation.

The Times of Argentina, commenting on this business deal, says :—

> We would remind those fanatics who adhere to the Rural Society's slogan "Buy from those who buy from us," that Argentina has herself missed an excellent opportunity to make good the phrase. We understand that Great Britain is Argentina's best customer, and that the Republic is anxious to further trade relations with the former by all means in her power. Yet, when the moment for the test comes, Argentina goes to the country which offers her the best terms, and we are far from criticising her for that step.

EXAMPLES IN AIRCRAFT.

To a smaller extent, though in a way which may have far-reaching results, the Treasury has likewise cramped our trade in aircraft. The Air Council, true to the doctrine that the strength of the Royal Air Force is based on a sound and well-established Aircraft Industry, has always done its best to help the Trade to get foreign business. And always the good intentions of the Air Council have been baulked by the Treasury.

On several occasions the Flying Services of foreign nations have expressed the wish that some of their officers should be trained at R.A.F. Establishments,—for all nations recognise that the R.A.F. is the best trained and most efficient Flying Service in the World. And in every case the Treasury has insisted that such officers shall not only pay all their own expenses while here, but shall pay heavy fees to the British Government for their training.

The result has been that in most instances, when negotiations have been opened with the Air Ministry, foreign officers have gone to France instead, where they have not only been given their flying training free, but have been given special technical training and have practically been the guests of the French nation during the whole period of their training. And naturally those officers have imbibed French ideas about methods of training and about machines, with the result that when they have gone back to their own countries the French Industry has benefited by their orders.

THE SHORT SINGAPORE (two Rolls-Royce Condor engines) at Malta, during Sir Alan Cobham's delay at that place.

Inspection!

A few Napier Achievements.

Schneider Trophy, 1927. Winner, Supermarine-Napier with Napier engine. Average speed, 281·669 m.p.h.

Cape to Cairo and back. Twice flown by 4 Fairey machines, each fitted with a Napier engine—100,000 engine miles.

Spain to Buenos Aires. Flown by Major Franco with a Dornier flying-boat fitted with 2 Napier engines. 6,259 miles in 59 hours.

THE system of inspection at the Napier factory reduces to a minimum the possibility of faulty workmanship or material finding its way into a Napier Engine. When the raw material is delivered it is tested to confirm that it is up to standard. Then after every one of the many operations necessary in the construction, an inspection is made to see that the very fine limits laid down have been adhered to. By this means every Napier is equally reliable. That is why there are no indifferent Napiers.

The illustration shows the inspection at the Napier factory of the parts of the Rear End Cover. As with this assembly, so with every part in the Napier. This is just one of the many reasons why the Napier is so much more reliable than other engines. This has been proved in actual service, not only on long distance flights and in high speed races, but in daily service in the Royal Air Force and on commercial air lines.

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Quite recently a certain Power of considerable importance was negotiating about buying a certain type of English machine. The official commanding the Flying Service of that Power made known through an intermediary that he would like two of his officers to have special training in England on the type of machine which he thought of ordering. He did not like to ask for them to have this training, but said that if they were *invited* by the Royal Air Force he would be delighted for them to go to England and that they would, of course, pay all their own expenses while here.

Also he wanted one of the latest machines of this particular type to be sent to his country to demonstrate that his choice was sound. This would seem to be quite a reasonable thing to arrange.

But even that was banned by officialdom. The machine was not allowed to go, the officers were not invited, and we lost the order.—C. G. G.

(To be continued.)

INTERNATIONAL IMPUDENCE.

Nothing could better illustrate the presumptuousness of the self-styled International League of Aviators than its "award," announced by *Reuter* last week, of the title of "Champion Woman Aviator" to the Honourable Lady Bailey, and of "Champion Aviator" to Colonel Charles Lindbergh, to each of whom is to be presented one of those ponderous trophies which Mr. Clifford Harmon is so fond of broadcasting whether the recipients want them or not.

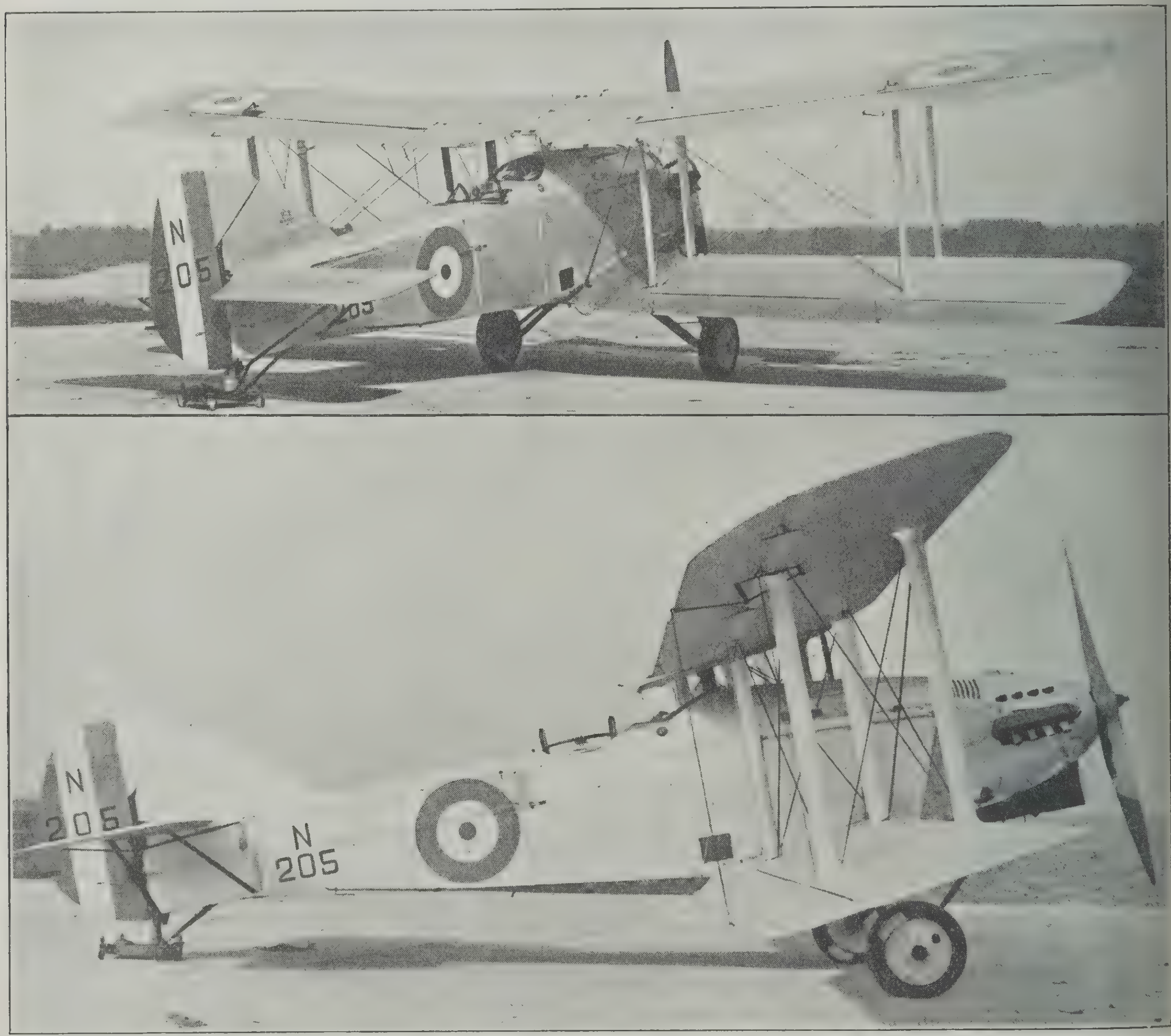
Of these two awards, the first is an insult, and the second is an impertinence.

Lady Bailey is a very good pilot and has done an immense amount of flying. But she happens to be a gentlewoman, and she flies for sport. Though she happens to hold the World's Height Record for light aeroplanes and to have flown in a few races, she has never done, nor has she ever set out to do, any of the sensational things required of "World's Champions." To label her with such a title, especially at the hands of Mr. Harmon's so-called "League," is much as if some little self-advertising clique of jockeys were to elect the Master of the Quorn "Champion Horseman of the World," and to inflict on him replicas of those lamentable Marly Horses.

As for Colonel Lindbergh, for this comic "League" to elect him a "Champion" is merely ludicrous. Charles Lindbergh is just himself, and he is what he is by virtue of his own personality. Others flew the Atlantic before him. Chamberlin and Levine, and Brock and Schlee, have since far exceeded his performance as a feat of flying, if mere performance constitutes a championship. There are other pilots who are neater and more skilful than he. But that does not diminish our esteem and affection for Charles Lindbergh. Why then should he be labelled "Champion" by Mr. Harmon's little coterie?

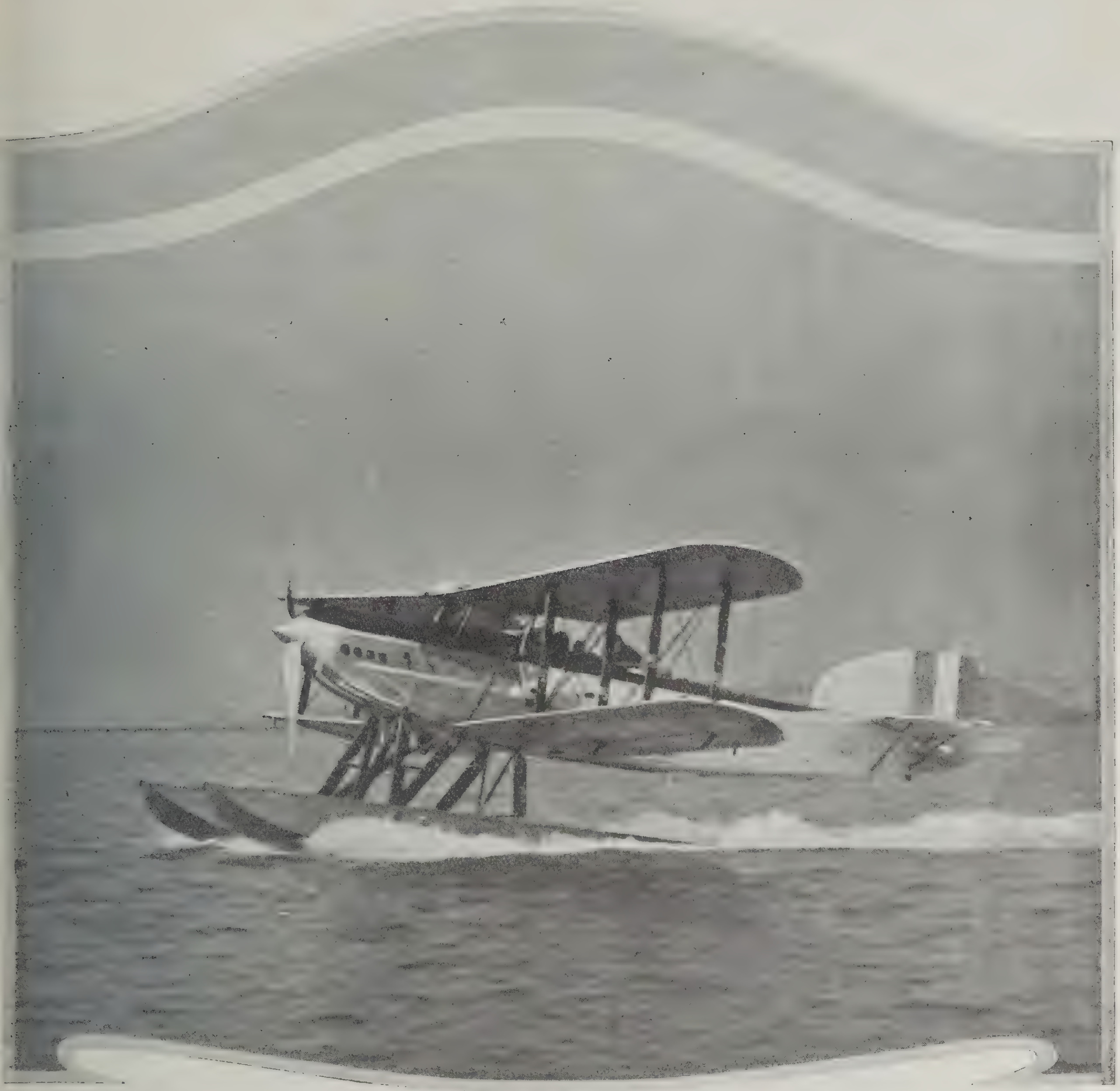
The said coterie has no standing whatever among the representative bodies of aviation. Neither the Aero Clubs pertaining to the *Fédération Aéronautique Internationale,* nor the Trade Societies of the various countries, recognise its existence. It has just as much right as, and no more than, any private individual, to present medals and monuments to persons who are in the public eye. If such persons like to accept those gifts, and so give the desired publicity to Mr. Harmon and his hangers-on, that is their own affair. But one states emphatically that for such a coterie to confer the title of "Champion" is presumptuous and impertinent.

C. G. G.



(R.A.F. Official photographs.)

THE HANDLEY PAGE HARROW II (Napier Lion engine).—The Harrow II is a two-seater torpedo carrier convertible from wheels to floats, which may also be used as a bomber. It is fitted with the Handley Page automatic slot and aileron control, and has in addition slots along the whole leading edge of the wing which can be opened at the will of the pilot. As a result the machine has an abnormal speed range—from below 50 m.p.h. (80 km.h.) to nearly 140 m.p.h. (225 km.h.) and is under complete control and completely stable at all speeds and angles.



The Fairey III.F. as a Seaplane.

The Fairey Aviation Company, Limited, are in full production with the General Purpose and Fleet Air Arm Types of the latest successful aircraft, the Fairey III.F. The demand for the Fairey III.F. was the response to the creation of the only British aircraft designed to meet both the Naval and Military requirements of the Royal Air Force, without sacrifice of performance. Land and sea undercarriages are interchangeable in two hours. Wide adaptability, outstanding performance, exceptionally robust construction, have put the Fairey III.F. into full production for H.M. Britannic Government and Foreign Governments.

FAIREY

Aircraft

THE ROYAL AIR FORCE.

The London Gazette.

Jan. 17.

GENERAL DUTIES BRANCH.—The following Flt. Cadets, having successfully passed through the R.A.F. Cadet College, Cranwell, are granted perm. comns. as Plt. Offs. with effect from and with seniority of Dec. 27, 1927:—E. A. Jones, K. F. T. Pickles, A. W. Hunt, E. R. White, D. J. Waghorn, N. A. Tait, W. H. Hutton, G. H. H. Proctor, J. S. Dewar, R. C. Field, C. E. St. J. Beamish, J. R. H. Pott, P. J. H. Halahan, H. C. Parker, J. H. L. Dillon-Trenchard, W. K. Beisiegel, H. A. Constantine, S. L. Blunt, H. H. Leech, N. B. Norris, S. R. Groom, P. J. B. Chalmers, J. E. Allen, J. E. MacCallum, E. J. Hill.

The following are granted S.S. comns. as Plt. Offs. on probation, with effect from, and with seniority of, Dec. 30, 1927:—H. Bailey, V. S. Bowling, G. C. Butler, C. W. F. Carter, T. J. Clarke, N. W. Creasy, R. N. Dashwood-Tandy, W. H. B. De Courcy-Wheeler, B. G. D'Olier, E. D. Elliott, D. A. Forbes, W. R. Hartwright, J. O. C. Huggett, J. B. Mackenzie, K. I. F. C. Norman-Wright, N. C. Odbert, P. B. T. Rowland, P. B. Silk, J. H. T. Simpson, J. S. Tanner, W. R. Tope, R. C. Warner, W. R. C. Wilkins, L. E. A. Wright.

The following are granted S.S. comns. as Plt. Offs. on probation, with effect from the dates indicated, and with seniority of Dec. 30, 1927:—J. B. Fyfe (Dec. 31, 1927); R. A. E. Birch (Jan. 2); B. W. Figgins (Jan. 7).

The following Plt. Offs. are promoted to the rank of Flg. Off.:—J. Constable-Roberts (Sept. 13, 1927); G. M. Beattie, J. A. E. Binnie, W. C. McNeil, J. E. McC. Henderson (Oct. 11, 1927); L. E. R. Fisher, M.C. (Lt. R.A.R.O.) (since deceased); L. T. Keens, K. C. Netherton, H. J. G. E. Proud, B. F. O. Smith (Nov. 8, 1927). The following Plt. Offs. on probation are confirmed in rank:—C. C. D. Williams (Oct. 24, 1927); K. E. Parker (Nov. 30, 1927).

Flg. Off. R. Legg (Lt., K.O.S.B.) relinquishes his temp. comn. on return to Army duty (Jan. 3); Flg. Off. J. W. Vanderbeeck relinquishes his S.S. comn. on account of ill-health (Jan. 18).

MEDICAL BRANCH.—Flg. Off. J. D'I. Rear is promoted to the rank of Flt. Lt. (Jan. 1).

Appointments.

Week ending Jan. 23.

GENERAL DUTIES BRANCH.—Group Captain J. H. A. Landon, D.S.O., O.B.E., to H.Q., Halton, for administrative duties, 1/2.

Wing Commanders E. L. Gossage, D.S.O., M.C., to Air Ministry, Directorate of Organisation and Staff Duties, for Air Staff duties, 1/1. J. E. A. Baldwin, D.S.O., O.B.E., to R.A.F. Depot, Uxbridge, whilst attending course at Imperial Defence College, 16/1.

Squadron Leaders G. F. Breese, D.S.C., to No. 99 Sqdn., Upper Heyford, 16/12. T. W. Elsdon, to H.M.S. *Furious*, 6/1. V. Greenwood, to R.A.F. Depot, Uxbridge, 20/1. G. C. Pirie, M.C., D.F.C., to H.Q., 'Iraq, 6/1.

Flight Lieutenants E. N. T. Edwardes, to No. 8 Sqdn., Middle East, 6/1. G. M. Moore, M.C., to C.F.S., Wittering, 21/1. S. E. Storrar, to No. 7 Sqdn., Worthy Down, 16/1. G. T. Richardson, to No. 111 Sqdn., Duxford, 19/1. S. T. B. Cripps, D.F.C., to No. 19 Sqdn., Duxford, 25/1.

Flying Officers E. T. St. M. Brett, to No. 7 Sqdn., Worthy Down, 30/12. A. W. Rowbotham, to R.A.F. Depot, Uxbridge, 21/1. V. G. H. Gee, to R.A.F. Depot, Uxbridge, 18/12. J. N. Berkeley-Miller, to No. 208 Sqdn., Middle East, 23/12. J. W. Busteed, to H.Q., Middle East, 3/1. C. G. C. Sullivan, to R.A.F. Depot, Uxbridge, 18/1. C. Guppy, to R.A.F. Training Base, Leuchars, 11/1. C. V. Lock, to No. 99 Sqdn., Upper Heyford, 15/1. G. M. Pitts-Tucker, to No. 2 Arm. Car Coy., Middle East, 4/1. A. D. McDowall, to No. 100 Sqdn., Bicester, 10/1. J. E. Davies, to No. 4 F.T.S., Middle East, 5/1.

Pilot Officers C. R. McEvoy, to No. 31 Sqdn., India, 7/1. J. R. H. Pott, to No. 111 Sqdn., Duxford, instead of to No. 43 Sqdn.; 17/12. P. J. B. Chalmers, to No. 43 Sqdn., Tangmere, instead of to No. 111 Sqdn., 17/12.. E. N. V. Everett and E. J. H. F. Moreton, to No. 4 F.T.S., Middle East, on appointment to S.S. Comns., 13/1. The undermentioned Pilot Officers are posted to No. 2 F.T.S., Digby, with effect from 14/1:—J. E. M. Bainbridge, H. Bailey, V. S. Bowling, G. C. Butler, C. W. F. Carter, N. W. Creasy, R. N. Dashwood-Tandy, W. H. B. de Courcy-Wheeler, B. G. D'Olier, E. D. Elliott, D. A. Forbes, W. R. Hartwright, J. O. C. Huggett, T. Joyce Clarke, J. B. MacKenzie, K. I. F. C. Norman-Wright, N. C. Odbert, P. B. T. Rowland, B. P. Silk, J. H. T. Simpson, J. S. Tanner, W. R. Tope, R. C. Warner, W. R. C. Wilkins, L. E. A. Wright, J. B. Fyfe, R. A. E. Birch and B. W. Figgins. R. A. Chignell, to No. 2 F.T.S., Digby, 18/1. The undermentioned Pilot Officers are posted to No. 4 F.T.S., Egypt, with effect from 6/1:—H. R. R. Ackersley, S. O. Bufton, R. R. Carroll, E. E. Carter, D. S. Collins, F. B. S. Downey, M. M. Freeman, P. H. E. Grisewood, G. F. Hales, H. G. Hamilton, C. H. R. Little, J. F. Macdonald, J. E. McCann, D. B. McGill, D. Menzies, W. F. Murray, J. A. S. Outhwaite, G. F. Overbury, J. D. Richardson, J. L. Smallwood, F. L. Truman, S. R. Ubee, and G. Wood.

MEDICAL BRANCH.—Flying Officers J. D'I. Rear, J. Hill, M.B., and M. O'Regan, to H.Q., 'Iraq, 6/1.

STORES BRANCH.—Squadron Leader W. F. Bryant, to Central Supply and Petrol Dump, 'Iraq, 6/1.

Flight Lieutenants T. H. Jolley, to H.Q., Middle East, 6/1. J. H. Dale, to Aircraft Park, India, 6/12. J. Hobbs, to H.Q., India, 7/12. F. H. Sims, to Station H.Q., Hinaidi, 21/2.

Flying Officers A. J. Walker, to Aircraft Depot, 'Iraq, 16/12. F. C. Griffin, to No. 6 Sqdn., 'Iraq, instead of to Aircraft Depot, as previously notified, 2/12. E. A. Slater, to No. 2 Wing H.Q., India, 7/1.

ACCOUNTANT BRANCH.—Flight Lieutenant W. E. V. Richards, to School of Photography, Farnborough, 13/2. R. Byrne, M.C., to H.Q., Middle East, 6/1.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Tidworth to a Woodcock machine of No. 17 (Fighter) Squadron, Upavon, on Jan. 17, Plt. Off. Guy Stevinson, the pilot and sole occupant of the aircraft, was killed.

The Air Ministry regrets to announce that as the result of an accident to an experimental machine undergoing trial at Martlesham Heath on Jan. 23, Flg. Off. Harold Campbell Gambier Dauncey, the pilot and sole occupant of the aircraft, was killed.

The Far East Cruise.

The Service cruise of the four Supermarine Southampton flying-boats (Napier Lion engines), under the command of Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17, flew from Trincomalee, Ceylon, to Lake Pulicat, Madras, on Jan. 19, and to Cocanada, Madras, on Jan. 20.

The Flight left Cocanada and arrived at Chilka Lake, Bihar and Orissa, on Jan. 23.

The New Fighter Competition.

A series of trials are being held at the R.A.F. Aeroplane and Armament Experimental Establishment, Martlesham Heath, to select new equipment for the Fighter Squadrons of the R.A.F.

Three classes of single-seat fighter machines are required by the Air Ministry: the "Zone" class, which includes most of the machines engaged in the present trials, will be the new equipment of the immediate future, and the "Interception" class, which will be machines of even higher performance for later replacement. The third class is for Fleet Fighters.

THE AEROPLANE understands that there are about eighteen machines engaged in the trials at Martlesham.

Commands and Staff.

Group Captain J. H. A. Landon, D.S.O., O.B.E., whose appointment to H.Q. Halton for administrative duties is dated Feb. 1, 1928, was born at Brentwood in 1886, and educated at Haileybury. He entered the 1st (Volunteer) Battn., The Essex Regt., in 1905 and was promoted to the rank of Captain in 1908. He was seconded to the R.F.C. in October, 1914, and appointed Flight Commander in August, 1915, and Squadron Commander in March, 1916. He was an instructor at the C.F.S., in 1916. He was awarded the D.S.O. in 1917 for distinguished service in the field and the O.B.E. in 1919 for distinguished services during the war. He was mentioned in despatches twice. After the Armistice he was appointed to command No. 1 School of Technical Training, Manston, and in 1922 he was in the Department of the Air Member for Supply and Research, Air Ministry. In 1924 he was posted to H.Q. 'Iraq for flying (detached) duties, and in 1925 he was appointed to command the R.A.F. Station, Hinaidi. He was restored to the Home Establishment in 1926 and appointed Station Commandant at Andover.

Wing Cdr. E. L. Gossage, D.S.O., M.C., whose appointment to the Air Ministry, Directorate of Organisation and Staff Duties, for Air Staff Duties, is dated Feb. 1, 1928, was born in 1891, and educated at Rugby and Trinity College, Cambridge. He entered the Royal Artillery in 1912 and went to France with the XXV Brigade, R.F.A., on Aug. 18, 1914, and served in the battles of Mons, the Marne, the Aisne and the first battle of Ypres. He learned to fly on a Maurice Farman biplane at South Harrow, and his Royal Aero Club Certificate No. 1120 is dated Mar. 10, 1915. He was appointed to the R.F.C. in May, 1915, and appointed Flight Commander in September, 1915, and Squadron Commander in May, 1916. He was awarded the M.C. in 1916 and the D.S.O. in 1919. After the Armistice he was posted to the Air Ministry, Directorate of Operations and Intelligence. On Jan. 1, 1921, he was promoted to the rank of Wing Commander, and appointed to command the School of Army Co-operation, Old Sarum. In 1923 he was posted to the Staff College, Camberley, for a course, and in 1925 he was appointed to the Directing Staff at Camberley.

Wing Cdr. J. E. A. Baldwin, D.S.O., O.B.E., who has been selected to attend the 1928 course at the Imperial Defence College, was born in 1892 and educated at Rugby and Sandhurst. He entered the 8th Hussars in 1911. He learned to fly on a Maurice Farman biplane, and his Royal Aero Club Certificate No. 971 is dated Nov. 17, 1914. He was seconded to the R.F.C. in 1915 and appointed to command No. 55 Squadron, R.F.C., on its formation in March, 1917. He was awarded the D.S.O. in 1918, the O.B.E. in 1919, the Order of the Crown of Belgium in 1917, and the Croix de Guerre in 1918. After the Armistice he was posted to the R.A.F. Depot, Uxbridge. In 1921 he was promoted to the rank of Wing Commander and appointed to H.Q. No. 7 Group, Andover. In 1922 he was posted to the R.A.F. Staff College, Andover, for a course, and in 1923 he was appointed to H.Q. Middle East for Air Staff (Training) duties.

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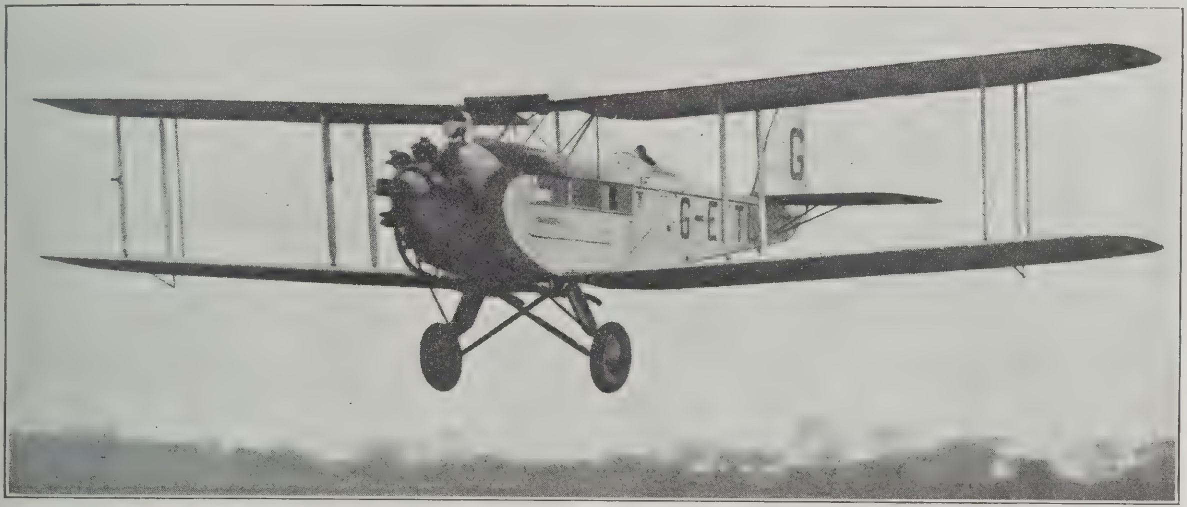

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Air Control of a Mechanised Force.

A series of articles on Some Aspects of Mechanisation, by Colonel H. Rowan-Robinson, C.M.G., D.S.O., began in *The Army, Navy and Air Force Gazette* on Jan. 5. The second article of the series appeared on Jan. 19 and deals with Command. In this article Col. Rowan-Robinson discusses the control problems of a mechanised force, and presuming that ground control is impossible, considers the feasibility of air-control. He gives the following serious drawbacks :—

(1) Personal danger to the commander and consequent likelihood of having to find and send into the air one or more new commanders in the course of the battle.

This is a very real objection, especially in view of the recent improvement in anti-aircraft work; and the replacement of the commander in such a rapidly-moving battle will be no easy matter. It might be possible to keep a second-in-command or a senior staff officer in the air to take his place, but this is an extravagant method, and a better solution might be to allow (successively if necessary) one of the other officers who would normally be in the air at the time to take command—the C.R.A., the officer conducting reconnaissance, or the senior formation-leader in the R.A.F.

(2) A special aeroplane will be needed, so built that—

(*a*) The pilot can act as gunner as well as driver

(*b*) The commander has facilities for really good observation, quick communication with pilot, writing, study of maps and speaking on wireless telephone.

(*c*) It can carry a signaller and his equipment. (Only required if it be found that the commander cannot issue orders on the 'phone in addition to carrying out his other duties.)

As pilots act as gunners in single-seaters, and machines are built equal to the transport of 25 men, no impediment should arise with regard to (*a*) and (*c*); but there is said to be a real difficulty in building a machine in such a form that anyone but the pilot can obtain the good observation essential to the execution of air-control. In a service, however, that represents the solution of the major problem of "flight," is it likely that the lesser problem of "observation" will remain long unsolved?

(3) The need of a special escort.

One fighting plane will certainly be required for the protection of the commander; and possibly a whole flight—attached to the H.Q. of the force—for his protection and that of the other military officers in the air; for these people would be performing duties from the execution of which they should, if possible, not be distracted by the attack of enemy planes.

(4) Observation and direction may be impossible owing to the prevalence of low clouds and mist.

This is not as serious a drawback as might appear at first sight; for it is one that handicaps both sides equally. A motor-battle in a mist would be a pell-mell affair that no commander would willingly undertake unless he knew that his opponent was riding unprotected at anchor in a tank-harbour or committing some equally heinous tactical crime. It is much more probable that each commander would endeavour to profit by the mist either to effect repairs, of which there will be a continual need, or to gain a strategic advantage either by breaking contact or by placing himself, unobserved from the air, on his enemy's flank or line of communication.

Col. Rowan-Robinson goes on to say that in his opinion these obstacles are not insurmountable and are outweighed by the prospective advantages of such a system. He points out :—

In the first place, the commander obtains a clear view of all the preliminaries to the battle and can either impose his plan on his opponent or adjust it to meet the needs of the situation. Secondly, he can command during the various stages of the battle, however fast they may move, handling his heavy tanks, his light tanks, his field-guns and taking advantage of any mistakes committed by the enemy, in a way quite impossible on the ground. Thirdly, he is in close touch with his air-commander. And, lastly, he is in a position to conduct the pursuit.

R.A.F. SPORTS AND PASTIMES.

Rugby Football

R.A.F. versus Cambridge University :—The R.A.F. representative team played their first match of the season at Cambridge on Jan. 18. They were beaten by the University by a goal and six tries (23 points) to three tries (9 points). On the whole this was not a bad beginning for the R.A.F. team. Their final trial was delayed nearly a month by the impossible weather conditions and their match against Guy's Hospital was scratched for the same reason. The match against Cambridge is always rather a tough proposition, and the 'Varsity team this year is a particularly fast one and well together.

At the last minute the R.A.F. were without two of the selected threequarters and had to substitute reserves. Flg. Off. N. Carter played instead of Flg. F. S. Hodder and AC. Lawson (Manston) played instead of Flg. Off. C. P. Vines.

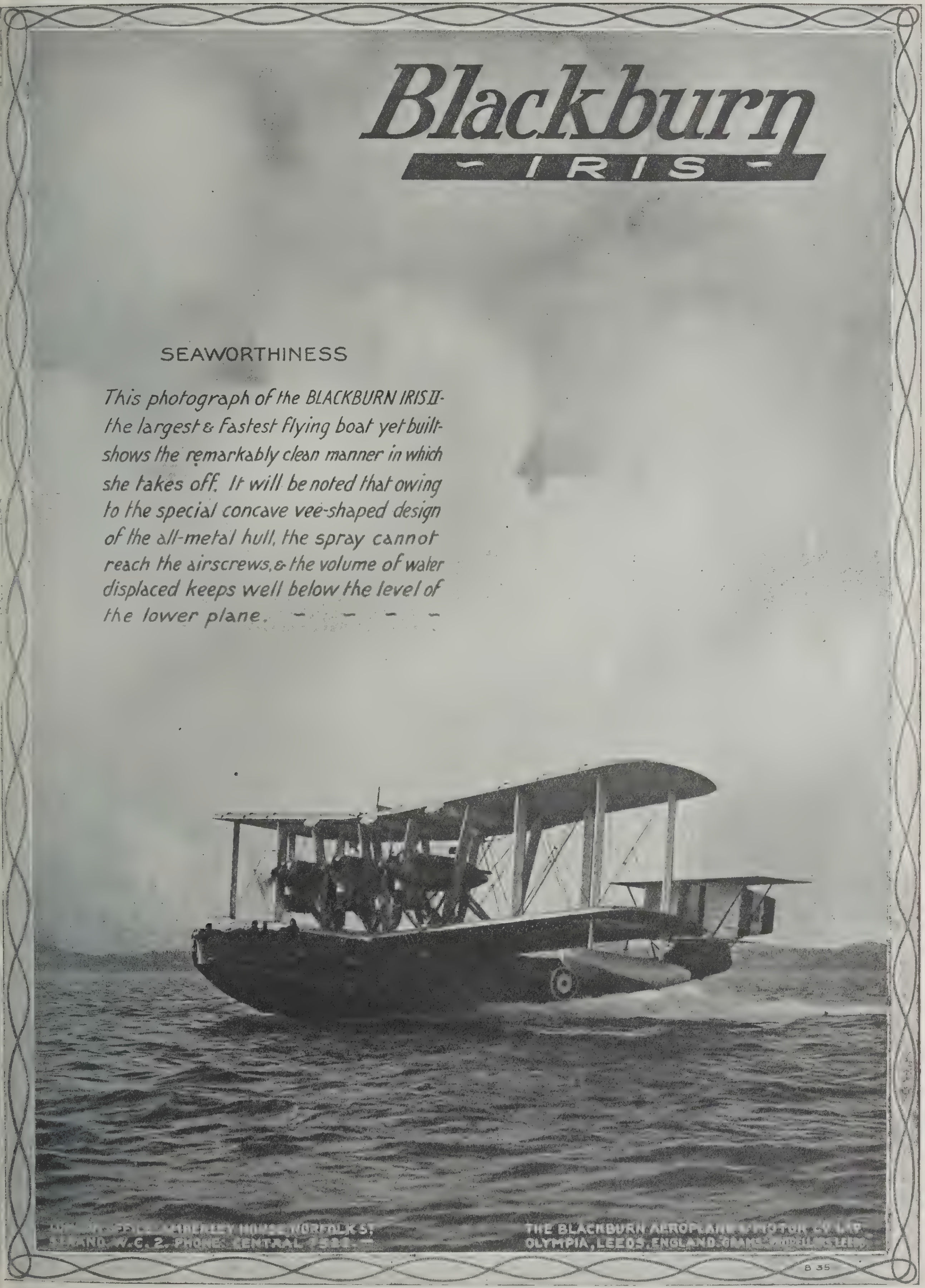
At full-back Flg. Off. Hale-Munro played a great game. He kicked a good length and with sound judgment. He has a particularly deadly flying tackle and if, occasionally, he got a little too far forward in the game it was invariably in pursuit and eventual rout of a dangerous foe.

The threequarters showed lack of combination in attack but remarkable skill and unlimited courage in defence. They were badly handicapped by the total lack of co-operation between the halves. Sq. Ldr. Russell had a bad off-day at scrum-half and practically all his passes went wild. They soared over Flg. Off. Odbert's head and landed in open country or enemy hands with heartrending regularity. Mr. Odbert made gallant efforts to retrieve and when he did so showed those qualities of enterprise and swift decision for which he has been capped for Ireland. It is to be hoped that with practice he and Sq. Ldr. Russell will manage to work up a partnership because the team cannot afford to lose either of them.

The forwards were without exception very good indeed. They shoved hard, heeled quickly and were fast and warlike in the loose.

The game started with a stiff attack by Cambridge headed by Windsor Lewis, Campbell scored a try five minutes from the kick-off after a fine bout of reverse passing, and Lewis kicked the only goal of the game. After a few minutes Cambridge scored again Heywood getting

THE WINNERS.—No. 4 Flying Training School's Rugby Football team which won the R.A.F. (Egypt) Inter-unit Cup. Left to right, standing : Plt. Off. Horner, Flg. Off. Dawson, AC. Hawker, Cpl. Henley, Cpl. Harding, Plt. Off. Beesley, AC. Best. (Seated) : S-M. Davey, Flg. Off. Bateman, Flt. Lt. Bates, Wing Cdr. F. K. Haskins, D.S.C., Flt. Lt. Flynn, Flg. Off. Coaker, Flg. Off. Dickens, Plt. Off. Fachiri, Sjt. Howse.



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B 35

over in the corner from an opening by Lewis. Then the R.A.F. forwards started getting the ball out of the scrum but unfortunately at the same time the R.A.F. backs started using it for a form of baseball. Lewis collected a stray pass, ran through, sold a dummy, and trotted over the line for a third try.

From this point the Air Force backs stiffened their defence and the opposition went crashing down in every direction. A dangerous breakthrough on the 'Varsity right wing was defeated near the line by Odbert, who came across like a high-speed interception fighter. A good rush by the Air Force forwards with the ball at their feet brought the game back to the enemy twenty-five and Christie broke away. He was brought down near the line and a scrum was formed. It wheeled smartly and Beamish got over for a try. Cambridge renewed their attack and scored again just before half time.

The R.A.F. began to look like a real team in the second half, but the weak link was still the lack of combination between the halves. Time and energy was wasted in rescuing the ball from positions in which it should never have been cast. Odbert started a good movement from a line-out but a free kick against the Air Force crushed that. Lawson took a high-speed pass, found himself hemmed in, and kicked for touch. The ball fell a few inches short but he followed up and collared the man who fielded it. Another forward rush by the Air Force was stopped by a free kick.

Concentrated shock tactics by Cambridge resulted in a try by Heywood on their left wing but the R.A.F. defence was so vigorous that practically the entire field was flat in the mud when the try was scored. At last the Air Force forwards got their reward. Christie and O'Malley, who had been in the front of the battle the whole time, broke away gathered the ball and exchanged passes until Christie scored.

The Cambridge forwards replied to this with considerable pressure but they were driven back by Hale-Munro who gathered the ball from their feet and kicked nearly half the length of the field into touch. Speed and combination between the 'Varsity backs sent Heywood over for another try but two minutes later Coote made a fine solo effort. He dribbled the ball over the line and fell on it. Campbell scored one more try for Cambridge in the last five minutes.—C. M. MCA..

The R.A.F. team were :—Flg. Off. T. A. Hale-Munro, back; AC. H. R. Lawson, AC. P. B. Coote, Flg. Off. N. Carter, and Flg. Off. G. D. Harvey, three-quarter backs; Flg. Off. R. V. M. Odbert and Sq. Ldr. J. C. Russell, half-backs; Flg. Off. C. J. S. O'Malley, F-S. G. F. Cockell, Sjt. A. C. Hall, Flt. Lt. C. D. Adams, Plt. Off. H. A. Constantine, Cpl. M. G. Christie, Flg. Off. G. R. Beamish, and L-AC. S. G. Collins, forwards.

R.A.F. *versus* BRISTOL.—Bristol beat the R.A.F. at Bristol on January 21 by a goal and three tries to one try. The Bristol forwards had the better of the scrums, but a good deal of the work of their backs was broken up by the sturdy defence of the R.A.F. backs. Odbert put up a good show for the R.A.F. and made many openings, but the passing of the R.A.F. three-quarters was faulty and did not improve to any extent until the last few minutes of the game. The changes in the R.A.F. team from that which played against Cambridge were P. G. Chichister instead of G. R. Beamish in the scrum, and a new three-quarter line, consisting of C. P. Vines, G. H. G. Brembridge, J. Norwood and F. S. Hodder. The only Air Force try was scored by C. P. Vines, who intercepted a pass between Corbett and Sherman, and scored.

Hockey.

The first match of the R.A.F. representative side of this Season was played at Bedford on Jan. 18, *versus* Bedfordshire. The weather was dull and wet, which unfortunately had such an effect on the ground that the standard of play suffered.

During the first half the exchanges were fairly even, each side pressing in turn and at the change over no goals had been scored.

In the second half the R.A.F. settled down and played greatly improved hockey. Taking advantage of their opportunities, they scored 3 goals to Bedfordshire's 1. Flt. Lt Inglis scored all 3 goals for the R.A.F.

The following players have been selected to represent the R.A.F. v. Royal Engineers, Chatham, on Jan. 25, at Bentley Priory, Stanmore :—

Goal—Cpl. G. Butler (Stanmore). Backs—Sq. Ldr. F. J. Murphy (Halton), Flt. Lt. J. M. Burd (Lee-on-Solent). Halves—L-AC. W. C. Maher (Henlow), Flg. Off. R. M. Thomas (Bircham Newton), L-AC. C. G. Crowther (Uxbridge). Forwards—Flg. Off. C. P. Vines (Farnborough), L-AC. S. J. Perigo (Bircham Newton), Flt. Lt. F. F. Inglis (Halton), Flt. Lt. H. N. Hampton (Stanmore), AA. C. G. Stevenson (Halton).

THE ESPIONAGE CHARGE.

The trial of W. F. R. McCartney and Georg Hansen at the Central Criminal Court on a charge of espionage was concluded on January 18, when both the accused were found guilty and sentenced to 10 years' penal servitude, with which runs concurrently two years' hard labour.

In the course of his reply to the speeches for the defence, the Attorney-General asked the jury to say that they had been successful in unearthing a dangerous spy organisation in this country. Unluckily, they had not been able to get into their net all who were concerned, but he trusted the result of this trial might make the others think before they pursued their dangerous, as well as treasonable, activities.

Passing sentence, the Lord Chief Justice said :—

You, and each of you, have been convicted upon the clearest possible evidence of offences which your own learned counsel have rightly described as terrible. These Acts of Parliament relating to Official Secrets are concerned, as was said at the opening of this case, with offences of many degrees of gravity, but your offences are among the gravest. The word "spy" has been from time to time used in this case. The word seems to be misapplied when it is used concerning either of you. A spy is very often a brave man who, for the sake of his country, encounters very serious personal risk, but in these matters you have been doing nothing for your country. You, McCartney, as a Scotsman, and you, Hansen, are, as you have said, a citizen of the German Republic, but what you have been doing and have been attempting to do is not in the interest either of this country or of Germany. You have become for pay the hireling agents of mere mischief, corrupt and corrupting, trafficking in official secrets for what you can get out of that traffic. I am bound to have regard to the fact that you, Hansen, undoubtedly played the part of one of the paymasters in a widespread organisation, and that you, McCartney, lent yourself to those acts against the interests of your own country.

THE RUNNERS-UP.—No. 216 Squadron's Rugby Football team which was in the final round of the R.A.F. (Egypt) Inter-unit Cup Competition. Left to right, standing : L-AC.s Rees, Morris, Radford, Lark, Palmer, Sjt. Scott-Taggart, L-AC.s Nottage, Pendlebury, (Seated) : Flg. Off. Pitts-Tucker, L-AC. Nunn, Flg. Off. Wayte, Wing Cdr. L. D. D. McKean, O.B.E., Flt. Lt. Rogers, J. Mutch, Esq., L-AC. Watts, Sjt. Palmer, Capt. Hinde, R.A.S.C., Cpl. Langman.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

ARGUMENT.

In this—the first of a new series of technical supplements o THE AEROPLANE—an effort is being made to supply a need which has for some time been felt acutely but which has ot as yet been satisfactorily met in this country.

During the War and for some years after the War "Aero-autical Engineering" appeared as a regular weekly sup-lement in THE AEROPLANE. After the War it gradually iminished in size and finally ceased completely to have ny distinct entity of its own.

When this supplement first appeared the manufacture f aircraft was a rapidly expanding Industry which was bsorbing from other branches of industry a personnel with elatively little, often no, knowledge of aeronautical echnique. And there was at that time a widespread need or an organ for the dissemination of technical information ouched in terms easily understandable by those possessed f little or no specialised knowledge.

To-day the Aircraft Industry in this country is in a tabilised condition. It is expanding, after the very severe ontraction which immediately followed the War, only at uch a rate that it can now rely for the supply of new echnical personnel upon one or another of the many xcellently equipped educational establishments—ranging rom Universities to some of the more progressive evening echnical schools—which can give instruction in the lements of aeronautical engineering. There is thus no eed to-day for a paper such as THE AEROPLANE to provide he A.B.C. of aeronautical technique.

At the same time there has been during the past few ears a vast increase in the amount of technical information bearing on aeronautics which is available for publication. No one man could himself read and properly digest all this information, and consequently much that is important and interesting of this vast flow perforce escapes the notice of many of those to whom it could be of the greatest value.

"Aeronautical Engineering" in its new form will endeavour to provide its readers with a guide to this constant output of new information. It will aim at providing as extensive a catalogue as is possible of all new Technical Aeronautical literature published throughout the World, but it will endeavour to be more than merely a catalogue.

It will have an individuality and a character of its own, expressed in articles, such as those to be found in this issue, dealing with selected subjects of importance and interest.

Even where it descends more nearly to the level of a catalogue, as in the records of new Technical literature received, it will wherever possible express its opinion as to the value or otherwise of each particular item.

Opinions thus expressed are necessarily personal to the writer thereof, and therefore fallible. The staff of "Aeronautical Engineering" can claim no immunity from common human infirmities. Their opinions will therefore always be debatable and sometimes erroneous.

Therefore they offer this new technical "Review of Reviews" to their readers in all due humility, hoping that it may prove to be as useful as it is meant to be, and ready at all times to consider the suggestions of those readers for the increase of that usefulness.

THE RATIONAL DETERMINATION OF LOAD FACTORS.

By P. A. RALLI, A.F.R.Ae.S.

The determination and selection of safety factors is of e utmost importance in aircraft design, for, whereas in ost branches of engineering it is more convenient and onomically satisfactory to add weight to a structure rather an submit each doubtful case to a minute inquiry, such a rocedure in aircraft is prohibitive. Structural weight reacts performance and, through wing and power loading, on anœuvrability, to such an extent that the strictest economy as to be practised in the use of material.

Unprecedented attention has consequently been devoted the discovery of the maximum loads to which a machine ay be subjected in the course of the almost infinite variety manœuvres of which it is capable, and searching investi-ations have been carried out into the properties of the aterials of which it is built. It can therefore be stated that though the margin of safety on aircraft appears narrow hen compared with that of other engineering devices the mitations in strength can be justified by elaborate research ork and by exceptional care in the manufacture and inspec-on of aircraft materials.

It is proposed in this brief article to consider the general nditions governing the choice of factors and to examine the obable influence on these of modern developments in air-aft performance.

Before proceeding it is necessary to give a rigid definition the terms used, as they are understood in aeronautical gineering.

The term "Factor of Safety" is the ratio of the breaking ad of a member to the maximum load expected to occur in at member; this is also known occasionally as the "Re-rve Factor" of the member.

On the other hand the term "Load Factor," or simply Factor," is a number which expresses the ratio of the aximum loads occurring in a given condition to the loads curring in normal steady flight, or with aircraft stationary.

The notion of "Factor of Safety" is common to all gineering practice, and is essentially a property of the rticular member referred to. The "Load Factor," how-er, affects every part of the machine equally and simul-neously and represents a uniform increase in the intensity those external forces which are taken as unity in the normal condition. The equivalent terms in classical engineering would be approximately "live loads" and "dead loads," the sum of the two being to some extent comparable to the "Load Factor."

But whereas in the older art the "Factor of Safety" constitutes by far the greatest proportion of the reserve strength of a member over dead load, in aircraft design it remains the smallest, and the "Load Factor," represents a load which is actually expected to occur, and cannot be regarded as a factor of safety. The importance of correctly determining the values of load factors can therefore hardly be over-estimated.

In the past a rather arbitrary method of selecting suitable load factors consisted in dividing machines into groups such as heavy bombers, reconnaissance machines, scouts, etc., and allotting some fixed conventional factors to each group. It has been recognised, however, that the primary conditions which should govern the choice of load factors are to be found in the required performance and specification of the proposed machine, so that two machines, even belonging to the same group, but with different performances or qualities (e.g., one designed for high speed at altitude and another for low landing speed and high ceiling) should have different load factors.

Attempts have therefore been made to rationalise the estimation of load factors by relating them more rigidly to actual flying or landing cases and investigating the nature and magnitude of the loads occurring in such conditions. Consistent development in this direction will be found in the official publications of the Aeronautical Research Committee, the American N.A.C.A., the Air Ministry's "Handbook of Strength Calculations" and many other published works. Extensive accelerometer tests are also available and constitute a valuable check on theoretical and laboratory results.

The conventional load factors are frequently reproduced and confirmed by these processes but in other cases it is found that they require considerable readjustment. I now propose to examine a few of the more important manœuvres and to indicate very briefly certain methods which have been found to be of service in illustrating more clearly the relationship between load factor and machine characteristics.

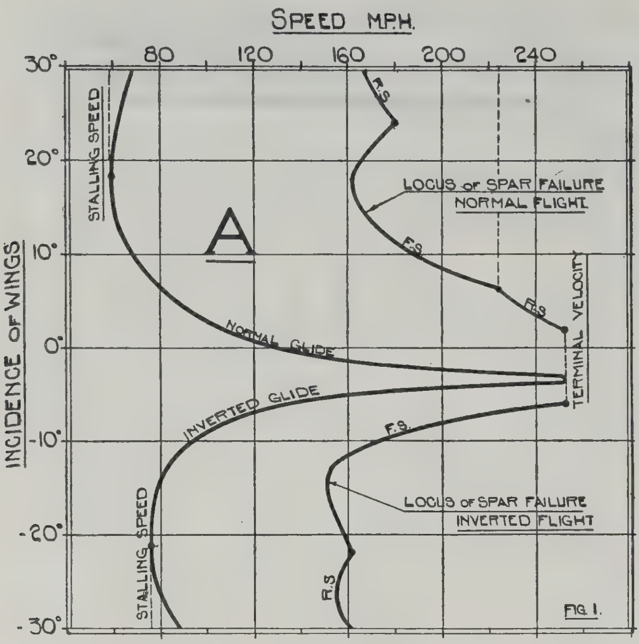


FIG. 1.

FLATTENING OUT.—This covers the cases known as "Normal Flight," C.P. forward and C.P. aft. The machine, having been put into a glide, up to some fraction of its terminal velocity, is asumed to be instantaneously returned to a coarser angle of incidence. There is then, for each speed from which this recovery is made, a maximum angle through which the machine can be rotated without exceeding a given load factor. This aspect of the manœuvre can be exhibited in the form of a curve, such as A, Fig. 3, which represents the particular relation between diving speed and angular travel which gives a constant load on the front and rear trusses respectively. If the trusses were designed to break at these loads, the curve would represent the locus of flattening out manœuvres which would just break the front or rear truss. The derivation of Fig. 3 is as follows :—

Let n_0 be the load factor and x_0 the C.P. position at which the front truss is designed to fail. Then the share of load on the front truss is (in the particular design condition only)

$$P_0 = n_0 W \frac{b-x_0}{b-a} \qquad (1)$$

Where a and b are the distances of the front and rear spars respectively from the leading edge and W is the weight of the machine. It should be noted that n_0 refers to the load on the C.P. and not to the load on a particular truss. On flattening out from different gliding speeds and through different angles both n_0 and x_0 will take new values, say n and x, resulting in different values of the load on the front truss, and this, in general will become :

$$P = nW \frac{b-x}{b-a} \qquad (1a)$$

at the end of the flattening-out operation.

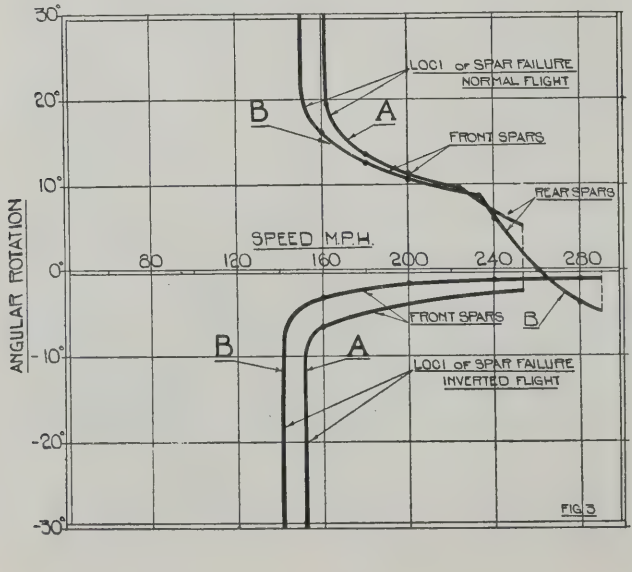


FIG. 3

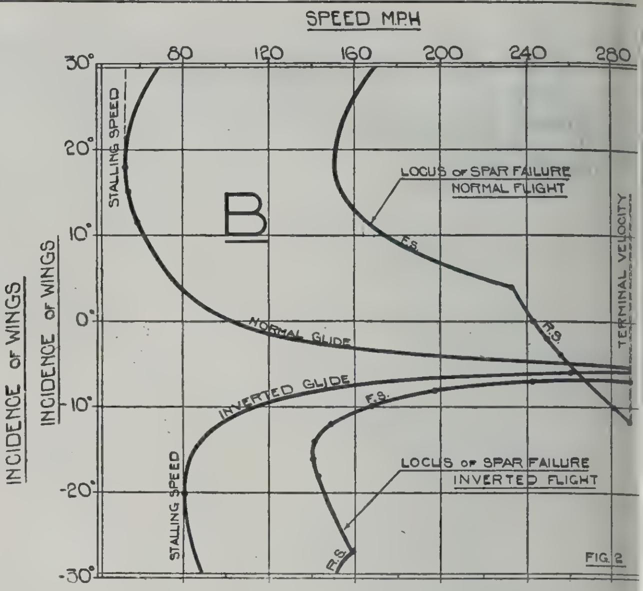


FIG. 2

To show the locus of manœuvres which make $P=$ equate (1) and (1a) :

$$n_0 W \frac{b-x_0}{b-a} = n W \frac{b-x}{b-a} \qquad (2)$$

and also : $n W = \frac{\rho}{g} K_L . S. V^2$ (3)

where S is the wing area, and K_L the lift coefficient in t fina lattitude at which $P=P_0$.

It is assumed that the time required to change attitu is too short materially to alter the speed, and this appro mation, which errs on the safe side, will be found to justified if reference is made to the well-known Americ Accelerometer Tests.

From (2) and 3) we obtain :

$$V^2 = n_0 \frac{W}{\frac{\rho}{g} K_L S.} \cdot \frac{b-x_0}{b-x} \qquad (4)$$

This equation enables the spar curves of Figs. 1 and 2 be plotted since x and K_L which occur on the right-ha side are both known functions of incidence only. It is al necessary to plot the speed incidence curve for the stea glide, from the usual relation :

$$W = \frac{\rho}{g} K.S.V.^2$$

where K is the resultant of overall lift and drag coefficie consistent with gliding at speed V, at "one load." T difference of ordinates between this and (4) at any giv speed then gives the permissible angle through which t machine can be rotated, as shown in Fig. 3. A similar p cedure can be followed for the rear truss and the correspo ing equation for this is :

$$V^2 = n_0 \frac{W}{\frac{\rho}{g} K_L S.V.^2} \quad \frac{x_0 - a}{x - a} \qquad (5)$$

where x_0 and n_0 now refer to the C.P. position and load fac respectively for which the rear truss was designed. T is represented by the lower branch of curve A.

It appears that if recovery from a dive is carried out fr a speed higher than 223 m.p.h., in the particular case of F 1, the rear truss will be the first to fail. This is usually t case on account of the lower factor allotted to the rear tr in practice. On the other hand it is impossible to prod failure by flattening out below 162 m.p.h. however great t angular variation.

The numerical results are naturally dependent on the C characteristics of the type of aerofoil section used; instance, in a "Constant C.P." aerofoil the cusps indicati the passage of the danger points from front to rear s would not occur.

Although this investigation illustrates the character of t flattening-out condition it does not in itself indicate the va of the load factor which should be adopted; in fact it sho that complete immunity from failure by flattening out almost unattainable. Any decision in this respect should based mainly on experience with well-tried machines, a on accelerometer tests. When however such a decision h been arrived at it becomes a simple matter to extend logically to any new design.

SOME UNEQUALLED PERFORMANCES.

REGULARITY-SECURITY-ENDURANCE

LORRAINE AERO ENGINES.

Rome-Melbourne-Tokyo (54,000 km.) by Colonel de Pinedo and Campanelli (450 h.p motor).
The Tour of Europe (7,500 km.) in 61 hours from start to finish, by Arrachart and Carol (450 h.p. motor).
Warsaw-Tokyo-Warsaw (20,250 km.) in 130 hours, by Lieut. Orlinski (450 h.p. motor).
Paris-Pekin (10,500 km.) in 6 days, by Pelletier Doisy and Carol (450 h.p. motor).
Circuit of the West Mediterranean (6,000 km.) in 41 hours 50 mins. from start to finish, by Pelletier Doisy and Gonin (450 h.p. motor).
Night Crossing of the South Atlantic, by Colonel Sarmento de Beires (450 h.p. geared motor).
Paris-Bombay-Belgrade (14,500 km.) in 89 hours flying time by Sondermayer and Baydak (450 h.p. motor).
Circuit of Eastern Europe (8,000 km.) in 7 days by Commandant Weiss and Assolant (450 h.p. geared motor).
Circuit of the Mediterranean (10,700 km.) in 6 days by Pelletier Doisy and Gonin (650 h.p. geared motor).
Michelin Cup, 1925 (Captain Pelletier Doisy), 1927 (Capt. Challes).
Breguet Cup, 1925 (Adjt. Sahuc), 1926 (Adjt. Duroyon).
King of Servia's Cup, 1926 and 1927.

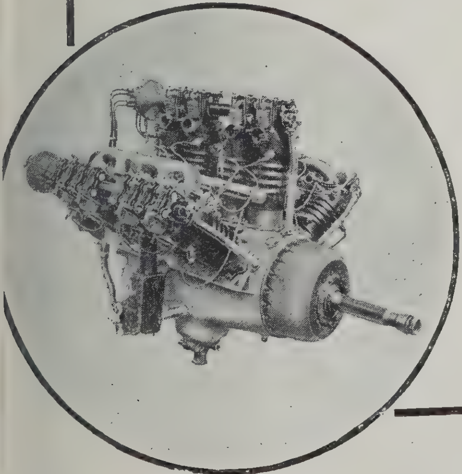
WATER-COOLED MOTORS

400 h.p. (12 cylinders in V), 450 h.p. (12 cylinders in W) direct drive and geared down.
480 h.p. (12 cylinders in W), 650 h.p. (18 cylinders in W) direct drive and geared down.

AIR-COOLED MOTORS

100 h.p. (5 cylinders radial), 230 h.p. (7 cylinders radial), 470 h.p. (14 cylinders radial).
Automobiles 12, 15 and 30 h.p. **Marine Motors**, 250 and 500 h.p. (petrol).

SOCIÉTÉ LORRAINE,



Factory:
Argenteuil (S & O)

Office:
11, Rue de Tilsitt,
PARIS.

Assume for instance that aeroplane "A" has been so modified that its resistance is reduced and at the same time its wing section is altered to give a higher maximum lift coefficient. If no readjustment is made in its load factors it will have new characteristics shown by curves B, Figs 2 and 3. It is obvious that the pilot carrying out manœuvres which were safe and familiar to him on type A will run into danger on type B; the load factors of B should therefore be increased and the necessary amount is easily deduced from the system of curves described. Since the whole tendency of modern development is to increase speed range precisely in the manner in which A above was converted to B, the subject of load factors should be carefully followed up in conjunction with such modifications.

NOSE DIVING.—This is an assumed state of steady motion at, or near, terminal velocity. It is probable that many failures occurred in this condition in the early days of aviation. Conventional factors were subsequently introduced which placed the machines on a saferbasis and were expressed as multiples of "Weight of machine times wing chord." This expression was suggested mainly from dimensional considerations because the wings are subjected to a severe torque, the front truss being forced down and the rear truss up, by almost equal loads

Following the general tendency already referred to, it is now usual to treat each design on its merits by ascertaining the forces from the aerodynamic characteristics of the machine. There remains here an element of uncertainty in the determination of aerofoil characteristics in the neighbourhood of no-lift angles, and for this reason the reserve factor, or actual factor of safety, should be comparatively large for this case

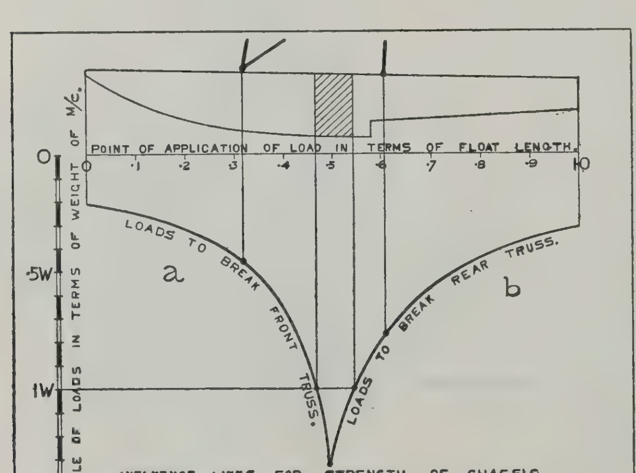
Even with the resources now available, it is found that the loads which can be expected to occur differ very considerably from those suggested by conventional factors; thus a certain design which from its classification would have been given a conventional overall factor of 1.50 *W* × chord, including safety factor, was actually found to be subject to 3.00 *W* × chord, actual load.

Such abnormal conditions are particularly liable to occur in experiments with unfamiliar wing sections and the nose-diving case should therefore always receive special attention. The modern high-speed fighting machine and still more the racing machine are exceptionally sensitive to the flattening out and nose-diving conditions.

INVERTED FLIGHT.—This case is open to investigation by the same process as that described for flattening out, using the portion of the steady glide curve beyond terminal velocity. Unfortunately wind channel data are mostly lacking for aerofoil characteristics at negative angles and for the time being conventional factors remain in force, with a tendency to increase these in value.

LANDING.—Landing factors are still largely empirical on account of the very complex nature of the problem, particularly in unsymmetrical cases, such as side-load and one-wheel landings. The conditions for seaplanes are even more baffling Yet these cases are important and cannot be entirely evaded; they affect the centre section as well as the actual landing chassis.

To assist the process of designing from experience a general method has been evolved and applied by the Fairey Aviation Co.'s Technical Department, which consists in drawing influence lines for well-tried machines and extending the results to new designs. An illustration is given (Fig. 4) which shows the characteristics of a seaplane chassis under sid load. The curves *a* and *b* give the positions and magnitud of the loads which, applied to any portion of the side of th float would have the effect of breaking either the front c the rear strut system of the undercarriage.



INFLUENCE LINES FOR STRENGTH OF CHASSIS STRUCTURE UNDER SIDE LOAD APPLIED TO FLOAT FIG 4

For instance over the narrow shaded area in the centre the float a load equal to or larger than 1*W* may be applie without damage to the structure; this permissible load considerably reduced as either boom is approached.

If a new design is proposed its characteristic curve is r quired to conform as closely as possible to that of the typic machine although its geometry may differ from it very widel Deliberate departures from type are of course desirable experiments, and these can be conducted with a full know ledge of the additional risk involved. In consequence may be found permissible to lighten certain parts of t structure, or, alternatively, weakness may be explained a remedied.

There are many other cases which must be examined the process of design, for which load factors have to selected. These include engine loads—which can be r ferred to engine and propeller performance, liberal allowanc having to be made for vibration—fin and rudder loads, contr forces, cut wires, etc. The scope of this article does not pe mit a discussion of these, but generally the same tenden to discard conventional factors in favour of rational physic assumptions is prevalent throughout.

I will now briefly consider the subject of actual facto of safety. A reference to accelerometer tests will show th in practice the load factors commonly used in designs a about 20 per cent. to 40 per cent. higher than the maximu recorded loading, and this margin should continue to ho providing the assessment of the load factor is carefully r adjusted to each type in the manner described above. Th therefore constitutes a first margin of safety. Beyond th further allowances are made to express the reliability of t material used; thus, in design, timber is usually allow a higher reserve factor than steel; in welded parts the fact of safety is increased about 100 per cent., etc.

Considerations of quality of workmanship also arise; intensive production is expected greater tolerance is nece sary to cover inevitable works' errors and variations in dime sions and in workshop processes, such as welding, sweatin heat-treatment, etc. Deterioration of parts by exposure service must also be borne in mind.

In conclusion, the general tendency of modern developme is to eliminate wherever possible the conventional factor a the empirical method, which must be looked upon as nece sary evils while they continue to exist. It is clear th much remains to be done in this direction, but from the r sults already achieved it can be hoped that progress in r search and full-scale tests will gradually enable aircraft facto to be more correctly and appropriately adapted to each typ ensuring that no machine shall be crippled by unnecessa weight or endangered in the course of a legitimate manœuvr

THE WARSAW AERODYNAMIC INSTITUT

A new aerodynamic laboratory, the Warsaw Aerodynam Institute, was opened in September, 1927. Until that ti the only aerodynamic laboratory in Poland was in the Wa saw Polytechnic School, and was but poorly equipped.

The new laboratory has been built mainly with funds rais from public subscriptions by the Aerial Defence League Poland at the instigation of Prof. Witoszynski, who has be mainly responsible for the design and layout of the equ ment.

Two wind tunnels, both of similar design, but differe sizes, are installed. These are of the open jet type with co pletely enclosed return air circuits, somewhat similar to tho in use at the Göttingen laboratory. The larger of the t has a working diameter of 2.5 m. and is equipped with 500 h.p. fan motor. A wind speed of 70 m./sec. (230 ft./se can be obtained. The smaller tunnel has a working diamet of 1 m. and a fan motor of 50 h.p. giving a maximum wi speed of 60 m./sec.

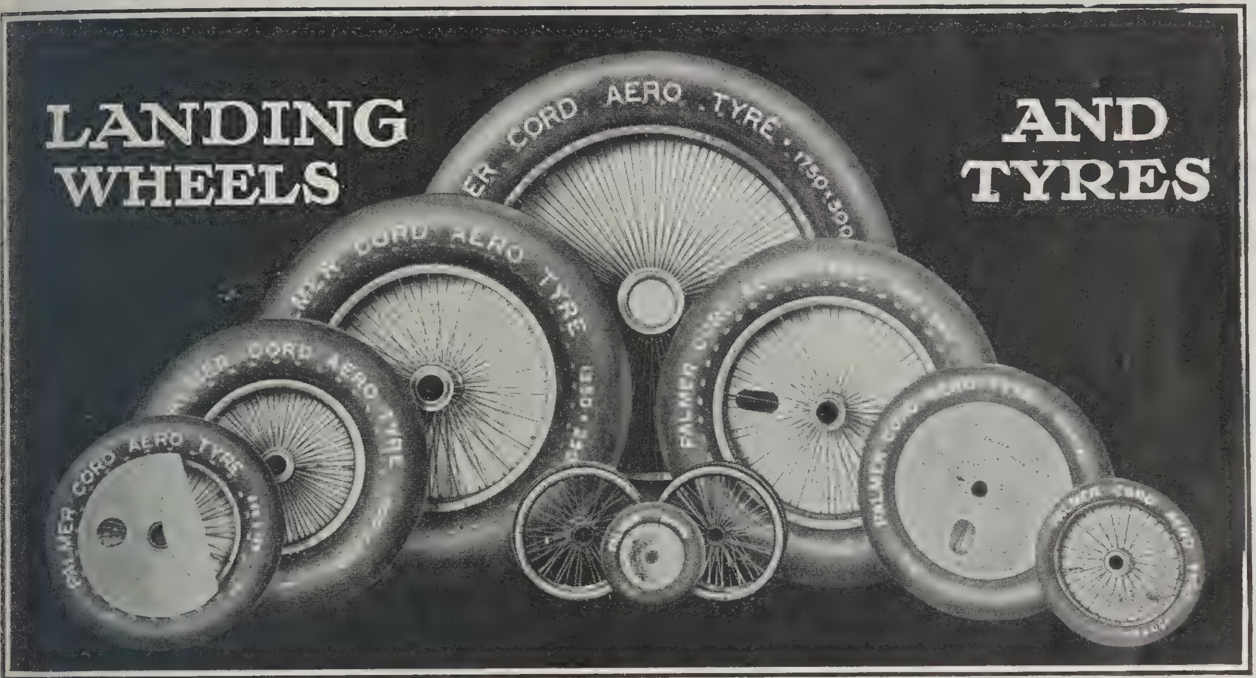
A novel form of balance has been designed for use in the tunnels. This consists of a rigid ring, considerably larg than the diameter of the air jet, suspended concentrica with the tunnel.

Models are suspended from this ring by four sets of filiar wires, so that all forces and moments on the model a transmitted to the ring. The moments produced about t suspension point of the ring are balanced by weights, a all forces and moments may be deduced simply.

A small ultra-high speed wind tunnel and a whirling a are to be added to this equipment as soon as possible.

The results of research work carried out in this n laboratory will be published periodically in French under t title *Travaux de l'Institut Aérodynamique de Varsovie.*

PALMER



STANDARD SIZES.

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
"	172	130.	38.09	Central
575×60	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
600×75	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
00×100	77	178.	44.45	132 46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132 46

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
650×125	119	178.	55.	132/46
"	147	178.	55.	Central
"	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
"	162*	185.	55.	Central
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	177	185.	55.	135/50
"	183	185.	55.	Central
"	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
"	174	250.	80.	Central
"	182	185.	55.	Central
"	187	220.	66.67	Central
"	201	185.	60.32	125,60

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900×200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	157	185.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
975×225	192	185.	60.32	Central
"	194	185.	55.	125/60
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
"	191	350.	150.3	Central
1750×350	193	400.	125.	Central

Vheels Nos. 161, 162, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres. †*Wheel No. 169 is fitted with Ball Bearings.*
Grease gun equipment is now a standard fitting on all wheels.

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(365)

NEW AIRCRAFT.

The Albatros L72C "Albis."

Made by the Albatros Flugzeugwerke G.m.b.H., Berlin-Johannisthal. (Passenger or Freight carrier, developed from Albatros L72A, but without slotted wings. In use by *Hamburger Fremdenblatt* for distribution of newspapers.)

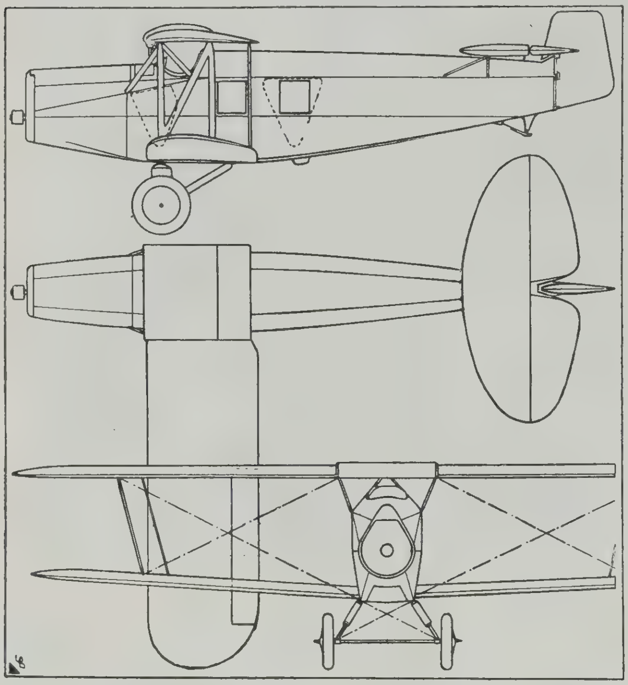
Wings.—Equal-winged biplane, no stagger. Duralumin box-spars, welded steel tube ribs. One set N-type interplane-struts per side. Inset ailerons on both wings.

Fuselage.—Welded steel tube, rigidly-braced forward, wire-braced aft. Nose, carrying engine, radiator and oil tank, detachable.

Tail.—Horizontal plane adjustable in flight. No fin, balanced rudder. Welded steel framing.

Undercarriage.—Cross-axle Vee type. Telescopic front leg with compression rubber and oil dash-pot.

Power Plant.—One 250/320 h.p. B.M.W.IV engine, on removable nose-piece of fuselage. Two gravity fuel tanks (320 litres = 70 galls.) in top centre-section.



Accommodation.—Open cockpit with side-by-side seats for pilot and mechanic behind engine bulkhead. Single control. Cabin with side door entrance between wings, fitted with four seats removable for freight carrying.

Dimensions.—Span 13.0 m. (42 ft. 9 in.), Length 10.25 m. (33 ft. 8 in.), Height 3.6 m. (11 ft. 9 in.), Wing area 44.5 sq. m. (478 sq. ft.).

Weights and Loadings.—Weight empty 1,275 kg. (2,804 lbs.), Loaded 2,075 kg. (4,570 lbs.), Useful load 455 kg. (1,000 lbs.), Wing loading 45.6 kg./sq. m. (9.8 lbs./sq. ft.), Power loading 6.5 kg./h.p. (14.3 lbs./h.p.).

Performance.—Max. speed 162 km.h. (101 m.p.h.), Landing speed 85 km.h. (53 m.p.h.), Climb to 1,000 m. (3,280 ft.) 7 mins., to 3,000 m. (9,840 ft.) 41 mins., Range at 153 km.h. (95 m.p.h.) 600 km. (372 miles) = 4 hours.

The Albatros L68C "Alauda."

Made by the Albatros Flugzeugwerke G.m.b.H., Berlin-Johannisthal. (Two-seater training machine.)

Wings.—Equal winged biplane, heavy stagger. Wooden box-spars, leading edge covered three-ply. One set of N type interplane struts (steel) per side. Unbalanced inset ailerons on both top and bottom wings.

Fuselage.—Welded steel tube, rigidly braced forward, wire braced aft.

Tail.—Steel tube frame, fabric covered. Elevators unbalanced. Rudder balanced.

Undercarriage.—Cross-axle, Vee type. Telescopic front legs with compression rubbers and oil dash-pot.

Power Plant.—One Siemens-Halske S.H.12 air-cooled radial 100 h.p. Interchangeable mounts for Siemens-Halske S.H.11, Armstrong-Siddeley Mongoose, etc. Gravity fuel tank (115 litres = 25 gallons) in top centre section.

Accommodation.—Tandem open cockpits, one below centre section, one behind trailing edge of top wing. Dual control.

Dimensions.—Span 10.1 m. (33 ft. 2 in.), Length 6.48 m. (21 ft. 3 in.), Height 2.87 m. (9 ft. 5 in.), Wing area 25 sq. m. (270 sq. ft.).

Weights and Loadings.—Weight empty 595 kg. (1,310 lbs.), Fully loaded 875 kg. (1,920 lbs.), Wing loading 34.9 kg./sq. m. (7.15 lbs./sq. ft.), Power loading 8.75 kg./h.p. (19.3 lbs./h.p.).

Performance.—Max. speed 135 km.h. (83 m.p.h.), Landing speed 70 km.h. (43 m.p.h.), Climb to 2,000 m. (6,560 ft.) 24 mins.

The Fokker "T.IV" Seaplane.

Made by Nederlandsche Vliegtuigen-Fabriek, Amsterdam. (Twin engine, twin float bombing or torpedo seaplane.)

Wing.—Tapered section and plan. Built on spruce and plywood box spars and plywood covered. Very narrow chord ailerons, unbalanced. Lies directly on top of body, but is attached only at four points above engine nacelles, which are rigidly braced to the fuselage.

Fuselage.—Fokker welded steel tube construction, rectangular section throughout.

Tail.—Adjustable tail plane, truncated triangle in plan, with horn-balanced elevators. Truncated triangular fin and horn-balanced rudder. Fin adjustable to relieve rudder bar on failure of one engine. Tail framing of welded steel tube.

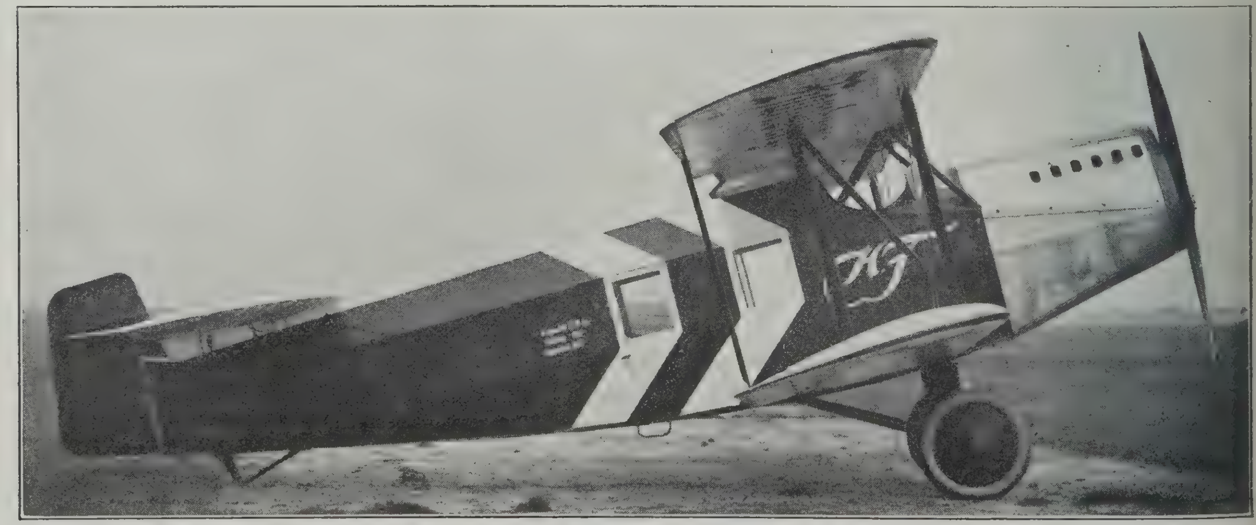
Undercarriage.—Two long, single-step floats, of box section, entirely of duralumin. These are supported by a very complex system of struts which tie floats to the engine nacelles and to the undercarriage. The structure is such that floats, engine nacelles and fuselage without wing form a complete structural unit.

Power Plant.—Two Lorraine-Dietrich "W" type engines of 450 h.p. each, fitted with reduction gears. Engines carried vertically over the floats in mountings attached to the undercarriage structure above mentioned. (Alternative engines of similar power can be used in place of the Lorraine-Dietrich.) Fuel tanks between spars in the wings, and oil tanks in the leading edge of the wings.

Accommodation.—Open cockpit in nose for observer-gunner with ring gun-mount. Pilot's cockpit with dual controls for two abreast immediately in front of leading edge of wing. Below the wing is a compartment 1.35 m. x 1.35 m. x 2.3 m. (4ft. 6 in. sq. x 8 ft. 6 in. long) for bombs, with diamond-shaped aperture in the bottom. Torpedo slinging gear is provided below this compartment. Well behind is an open cockpit with a gun ring for rear defence. Within the fuselage there is a space 1.35 m. square x 4.3 long (4 ft. 6 in. sq. x. 14 ft. 4 in. long) for the stowage of cameras, wireless gear, or other equipment. In the length of this compartment there is an abrupt step up in the bottom of the fuselage, and a machine-gun is mounted to fire through this step and below the tail.

Dimensions.—Span 25.8 m. (84 ft. 7 in.), Length 17.6 m. (37 ft. 8 in.), Height 6.0 m. (19 ft. 8 in.), Wing area 96.5 sq. m. (1,040 sq. ft.).

Weights and Loadings.—Weight empty 4,150 kg. (9,150 lbs.), Weight loaded 6,550 kg. (14,450 lbs.), Fuel 1,500 litres (330 galls.) = 1,130 kg. (2,500 lbs.) approx., Wing loading 68 kg./sq. m. (14 lbs./sq. ft.), Power loading 7.3 kg./h.p. (16 lbs./h.p.).

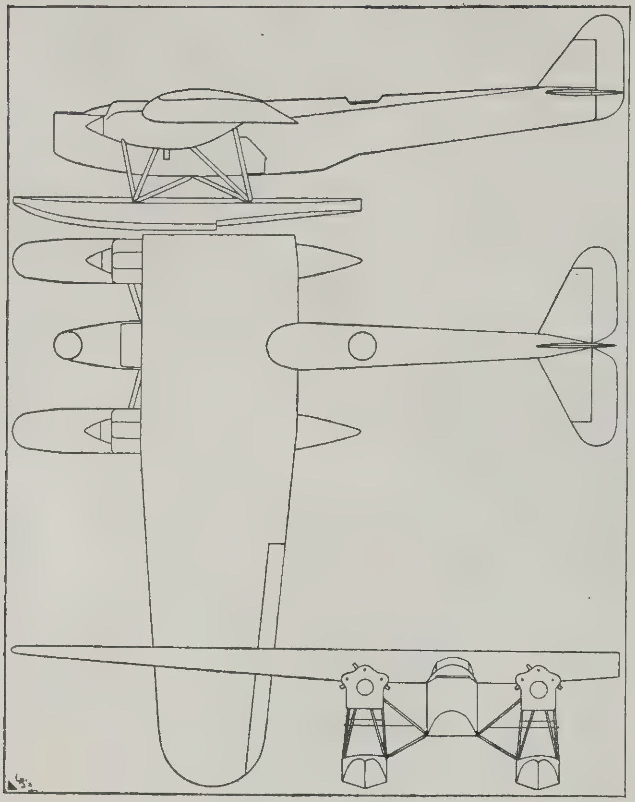


The Albatros Albis L72C.

A common fault in motor spirits is the development of one good quality at the expense of other equally important qualities. This is avoided in Shell Petrol, which has *every good quality.*

SHELL PETROL

Well-Balanced



Performance.—Max. speed 200 km./h. (124 m.p.h.), Landing speed 95 km./h. (59 m.p.h.), Climb to 2,000 m. (6,560 ft.) 16 mins., Service ceiling 3,700 m. (12,150 ft.), Range at 165 km./h. (102 m.p.h.), 1,200 km. (740 miles) = 7½ hours. Time to take off in in wind of 4/5 m. per sec. (8/10 m.p.h.) wind 27 sec. (On official trials somewhat better results are said to have been reached.)

The “Korsa 1” Monoplane.

Made by Korsa, Altstettin, Zurich. (Sporting and training machine.)

Wings.—High wing cantilever monoplane. Wooden frame, fabric covered. Built in two sections, attached directly to top of fuselage.

Fuselage.—Quadrilateral section, narrower at top than at bottom. Wood framing, three-ply covered to trailing edge of wing, fabric covered aft.

Tail.—Conventional in type except for large high aspect ratio rudder. No control surfaces balanced.

Undercarriage.—Wheels carried by two stub-axles carried on cantilever structures projecting from the fuselage. No axle.

Power Plant.—One six-cylinder Anzani air-cooled radial engine 50 h.p. Fuel tanks in wings. Carburettor (Zenith type) adjusted for heavy (S.G. = .72) motor spirit.

Accommodation.—Two seats in tandem below wings with large open side windows. (Alternatively three seats may be fitted with a corresponding reduction in fuel capacity.)

Dimensions.—Span 39 ft. 4 in. (12.0 m.), Length 22 ft. 4 in. (6.8 m.), Wing area 119 sq. ft. (11 sq. m.).

Weights and Loadings.—Weight empty 660 lbs. (300 kg.), Fully loaded 1,230 lbs. (560 kg.), Wing loading 10.3 lbs./sq. ft. (51 kg./sq. m.), Power loading 24.6 lbs./h.p. (11.2 kg.h.p.).

Performance.—Max. speed 98 m.p.h. (158 km.h.), Landing speed 43 m.p.h. (69 km.h.), Climb at sea level 750 ft./min. (228 m./min.), Ceiling 18,000 ft. (5,500 m.), Range at 78 m.p.h. (127 km.h.) 800 miles (1,290 km.).

Mexican Military Two-Seater “S.2.”

Made by Talleres Generales Aeronautica (Government Aircraft Workshops), Mexico. (Two-seater advanced training machine, convertible to fighter.)

Wings.—Equal-winged biplane. No stagger. One set N type interplane struts per side. Ailerons on top and bottom wings.

Fuselage.—Rectangular section to trailing edge of wings, apparently tapering to triangular section at tail.

Tail.—Normal form. Control surfaces unbalanced.

Undercarriage.—Cross-axle Vee type. (Original undercarriage said to be too weak and undergoing modification.)

Power Plant.—One B.M.W.III engine 185 h.p. Nose radiator.

Accommodation.—Crew in tandem behind wings.

Dimensions.—Span 11.2 m. (36 ft. 8 in.), Wing area 42 sq. m. (452 sq. ft.).

Weights and Loadings.—Weight empty 980 kg. (2,160 lbs.), Loaded 1,580 kg. (3,490 lbs.), Wing loading 37.6 kg./sq. m. (8.24 lbs./sq. ft.), Power loading 8.6 kg./h.p. (17.9 lbs./h.p.).

Performance.—Max. speed 190 km.h. (118 m.p.h.), Landing speed 95 km.h. (59 m.p.h.).

Note.—No information as to structural details. Data given taken from *Revista Aerea*, Mexico, October, 1927.

The Prudden Monoplane.

Made by The Prudden-San Diego Airplane Co., San Diego, Cal., U.S.A. (Passenger and freight carrier.)

Wings.—All duralumin frame, covered corrugated duralumin sheet. Rectangular plan form, mounted on top of fuselage and strut braced.

Fuselage.—Rectangular section, duralumin frame, duralumin covered.

Tail.—Rectangular tail plane and elevators, triangular fin and horn-balanced rudder. (All duralumin.)

Undercarriage.—Split-axle type with wide track. Vertical legs telescopic and attached to front-wing struts alongside wing engine mounts. Wheel brakes are fitted.

Power Plant.—Three Siemens-Halske S.H.12 air-cooled radials of 100/125 h.p. each. One in nose of fuselage, one below each wing over wheel track.

Accommodation.—Pilot ahead of wings, enclosed by Triplex glass wind and side screens and roof. Seats for six passengers in fuselage below wing.

Dimensions.—Span 52 ft. (15.9 m.), Length 35 ft. (10.7 m.), Height 10 ft. (3.05 m.).

Weights and Loadings.—Empty weight 2,250 lbs. (1,020 kg.). Loads not known. Tested at 3,750 lbs. (1,700 kg.) all up.

Performance.—No data yet available.

(*Aviation*, Nov. 28, 1927.)

The Wild X Biplane.

Made by Flugzeugbau A. Comte, Zurich-Oberrieden. (Military two-seater for the Government of the Republic of Colombia.)

Wings.—Equal chord biplane, small overhang on top wing, 1° dihedral and 2½° sweep-back. No centre section to top wing, which is carried from an inverted V cabane above body. Two pairs of interplane struts per side. Channelled spruce spars, three-ply ribs. Fabric covering. Narrow chord unbalanced ailerons on top only.

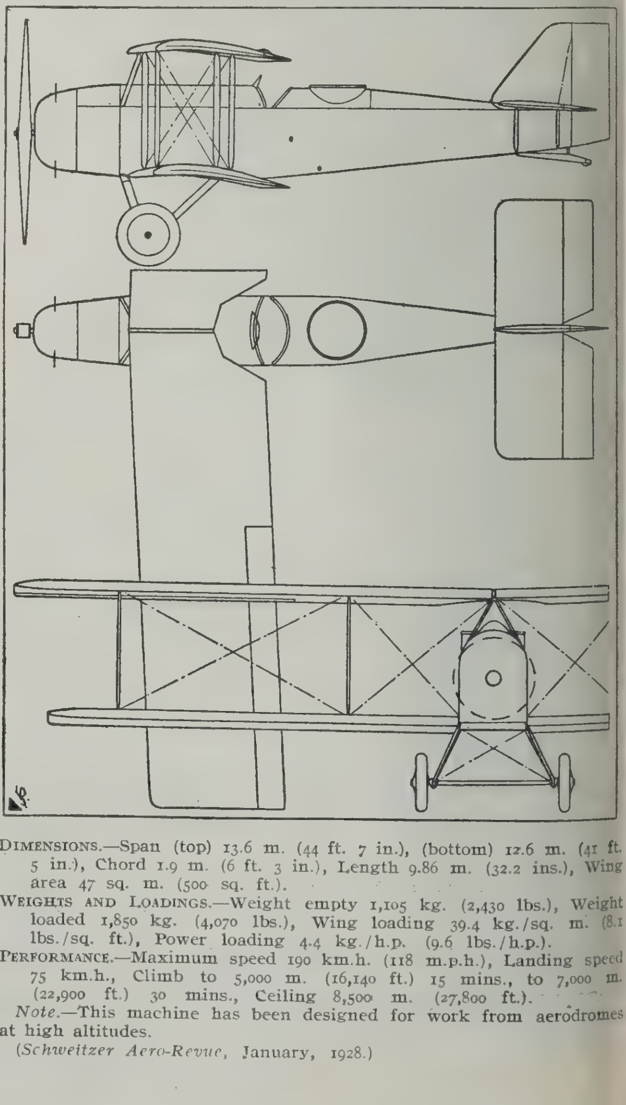
Fuselage.—Rectangular section. Wood framing, wire braced and fabric covered.

Tail Unit.—Steel tube framing, fabric covered. Tail plane (rectangular) strut braced to bottom of fuselage. Wire bracing tail-plane rear-spar to fin-post. Control surfaces unbalanced.

Undercarriage.—Cross-axle Vee type, rubber-cord sprung.

Power Plant.—Gnome-Rhone Jupiter IV engine, 420 h.p., compression ratio 6. 400-litre (88-gallon) fuel tank in fuselage between pilot and fireproof bulkhead.

Accommodation and Equipment.—Pilot below trailing edge, with one synchronised M.G. Gunner immediately behind with normal Scarff gun-ring. Gear for two 25 kg. (50 lbs.) bombs in front of pilot (in body). Sending and receiving W.T.



Dimensions.—Span (top) 13.6 m. (44 ft. 7 in.), (bottom) 12.6 m. (41 ft. 5 in.), Chord 1.9 m. (6 ft. 3 in.), Length 9.86 m. (32.2 ins.), Wing area 47 sq. m. (500 sq. ft.).

Weights and Loadings.—Weight empty 1,105 kg. (2,430 lbs.), Weight loaded 1,850 kg. (4,070 lbs.), Wing loading 39.4 kg./sq. m. (8.1 lbs./sq. ft.), Power loading 4.4 kg./h.p. (9.6 lbs./h.p.).

Performance.—Maximum speed 190 km.h. (118 m.p.h.), Landing speed 75 km.h., Climb to 5,000 m. (16,140 ft.) 15 mins., to 7,000 m. (22,900 ft.) 30 mins., Ceiling 8,500 m. (27,800 ft.).

Note.—This machine has been designed for work from aerodromes at high altitudes.

(*Schweitzer Aero-Revue*, January, 1928.)

The **WESTLAND WIDGEON** is the outstanding Light Monoplane of the year. Fastest light aeroplane to finish in the King's Cup Race, 1927.

The 1928 Model WIDGEON

is an advance on all previous light Aeroplanes—the ideal 'plane for Private Owners and for Flying Clubs.

High touring speed (80-90 m.p h.), low fuel consumption (15-20 m.p.g.). Designed for maximum safety and comfort. (British Air Ministry Aerobatic Certificate.) Excellent view for pilot and passenger. Wings fold for easy garaging in small space. No rigging to need adjustment.

ANOTHER SUCCESS—**1st** in Queensland Aerial Derby Speed Championship Cup.
November 12th, 1927. Flown over a 45 miles triangular course.

Full particulars and prices from
WESTLAND AIRCRAFT WORKS, Yeovil, ENGLAND.
Branch of PETTERS Ltd., Manufacturers of the World Famous Oil Engines.)
CONTRACTORS TO THE BRITISH AIR MINISTRY.
Applications from Agents fully qualified for Demonstration, Upkeep, and Sale of Light Aircraft Overseas will be carefully considered.

NEW AERO-ENGINES.

The Fiat A.S.III Schneider Trophy Engine.

Made by the Societa Anonima F.I.A.T., Turin, for the Macchi M.52 racing seaplanes.

Type.—12-cylinder 60° Vee water-cooled.

Cylinders.—145 m/m. bore × 175 m/m. stroke. Machined from steel forgings with separate welded steel jackets. Four overhead valves and two spark-plugs per cylinder. Valve seats and ports welded into cylinders.

Compression Ratio.—6.5.

Valve Gear.—Single camshaft over each row. Valves rocker-operated. Camshaft and valve-gear totally enclosed in light alloy casing. Two concentric springs per valve.

Pistons.—Magnesium alloy forgings. Flat heads. Three rings above gudgeon pin. Pin floats in pistons.

Connecting Rods.—Articulated I section rods. Big-ends bronze-backed white metal. Gudgeon pins locked to little-ends.

Crankshaft.—Six-throw seven-bearing type, with elliptic profile webs. Nickel-Chrome steel. Runs in bronze-backed white metal bearings.

Crankcase.—Magnesium alloy casting. All crankshaft bearings except thrust and journal at airscrew end carried entirely from upper half. Lower half carries two gear-type scavenger oil pumps and centrifugal water pump.

Auxiliary Gears.—All carried in a unit gearcase attached to rear end of crankcase. One plain bevel pinion driven by tail-end crankshaft drives two vertical shafts. One passes downwards and drives the oil pressure pump, and through a train of spar gears the oil, scavenger and water pumps. An intermediate worm gear drives a horizontal shaft for a petrol feed-pump. The other vertical shaft first drives two horizontal shafts for magnetos, and then two inclined shafts for the cam-shaft drive. All gears on this shaft are bevels.

Carburettors.—Three special duplex carburettors (Stromberg type) fitted between cylinders each feeding four cylinders. Induction branches water-jacketed.

Magnetos.—Two Marelli twelve-cylinder type.

Lubrication.—Pressure feed to each crankshaft bearing and thence through shaft to big-ends. Lead from rear crankshaft bearing to camshaft. Oil from camshaft returns over camshaft-gears by drive-shaft casing to crankcase.

Starting Gear.—Compressed air from a bottle at 8 atmospheres is passed through a carburetting device to a gas distributor and thence to cylinders on firing strokes. A hand magneto fires mixture in the cylinders.

Airscrew Drive.—Direct. Airscrew hub driven by parallel splines on end of crankshaft, and seats on one fixed cone, and one forced on by main hub nut.

Overall Dimensions.—1.59 m. (62.5 in.) long, 0.72 m. (28.3 in.) wide, 1,003 m. (39.5 in.) high.

Output.—970 h.p. at 2,500 r.p.m.

Weight, Dry.—410 kg. (904 lbs.) = 0.423 kg. (0.93 lbs.) per h.p.

The Lorraine Dietrich Air-cooled Radials.

Two radial air-cooled engines made by The Societe Lorraine des Anciens Etablissements de Dietrich et Cie, de Luneville, were shown at the last *Salon d'Aéronautique* in Paris and were described in The Aeroplane, Dec. 15, 1926.

These two—one a seven-cylinder and the other a fourteen-cylinder model—have now, with slight modification, passed the French type tests.

A third air-cooled radial, of five cylinders, has recently been added to this firm's productions.

The Lorraine-Dietrich engines have been designed in collaboration with Armstrong-Siddeley Motors, Ltd., and in general and in detail follow very closely the models set by the Armstrong-Siddeley series of engines of this type.

Cylinders.—Steel barrels with integral fins. Aluminium heads screwed on and locked by ring-nut which also acts as a cooling fin. Cylinders screwed into steel ring held in crankcase and locked by split locking rings. Two inclined valves per cylinder.

Pistons.—Light alloy forgings with flat heads and three rings above gudgeon pin.

Connecting Rods.—Articulated type. Half of big-end and master rod in one piece. Articulating pins carried on flanges projecting from big-end. Big-end journal bronze bush white-metal lined (split). Auxiliary rods bronze-bushed. Gudgeon pin bushes (bronze) float on pin and in rod. All rods I section.

Crankshaft.—In one piece, counterbalanced. Runs on two journal roller bearings.

Crankcase.—Aluminium alloy casting, nearly cylindrical, flanged at rear for mounting engine and carrying cover of induction chamber. A diaphragm—forward of flange—separates induction chamber from crankcase proper and carries rear crankshaft bearing. Front crankshaft bearing carried on a loose ring bolted to an internal flange, which ring serves as rear wall of cam-gear chamber. Front cover of crankcase carries tappet-rod guides, and crankshaft thrust race.

Valve Gear.—Operated by push rods and rockers from cam-rings, concentric with crankshaft and epicyclically driven.

Induction System.—Centrifugal impellor driven from crankshaft takes gas from carburettors and delivers to radial inlet pipes.

Lubrication System.—Dry sump system. Pressure pump supply to interior of crankshaft and thence to big-end bearings.

Auxiliary Gears.—Magnetos—or distributor and contact breakers—mounted on (front) cam-case cover. Oil and petrol pumps on (rear) cover of induction-fan case. Details of drives not available.

Specification.

Makers type No.	5Ab.	7 M.a.	14 A.C.
No. of cylinders	5	7	14
Bore	125 m/m.	135 m/m.	135 m/m.
Stroke	140 m/m.	150 m/m.	150 m/m.
Compression ratio	5	5	5
Diameter over all	1.126 m. (44 in.)	1.240 m. (49 in.)	1.240 m. (49 in.)
Length over all	.917 m. (36 in.)	1.164 m. (44.7 in.)	1.333 m. (52 in.)
Output	100 h.p. 1,350 r.p.m.	270 h.p. 1,800 r.p.m.	470 h.p. 1,800 r.p.m.
Weight	150 kg. (330 lbs.)	275 kg. (605 lbs.)	440 kg. (968 lbs.)
Fuel consumption per h.p./hour.	.26 kg. (.57 lbs.)	.26 kg. (.57 lbs.)	.26 kg. (.57 lbs.)
Oil consumption per h.p./hour	.012 kg. (4 oz.)	.012 kg. (4 oz.)	.012 kg. (4 oz.)

A New Russian Engine.

Designed by the Nautschnji Auto-Motorni Institut.

Type.—Five-cylinder air-cooled radial.

Cylinders.—Plain steel liners with screwed-on light alloy heads and barrels. Pressed in valve seats, and two vertical valves per cylinder. (Cylinder design very similar to that of Wright Whirlwind J-4 and earlier types.)

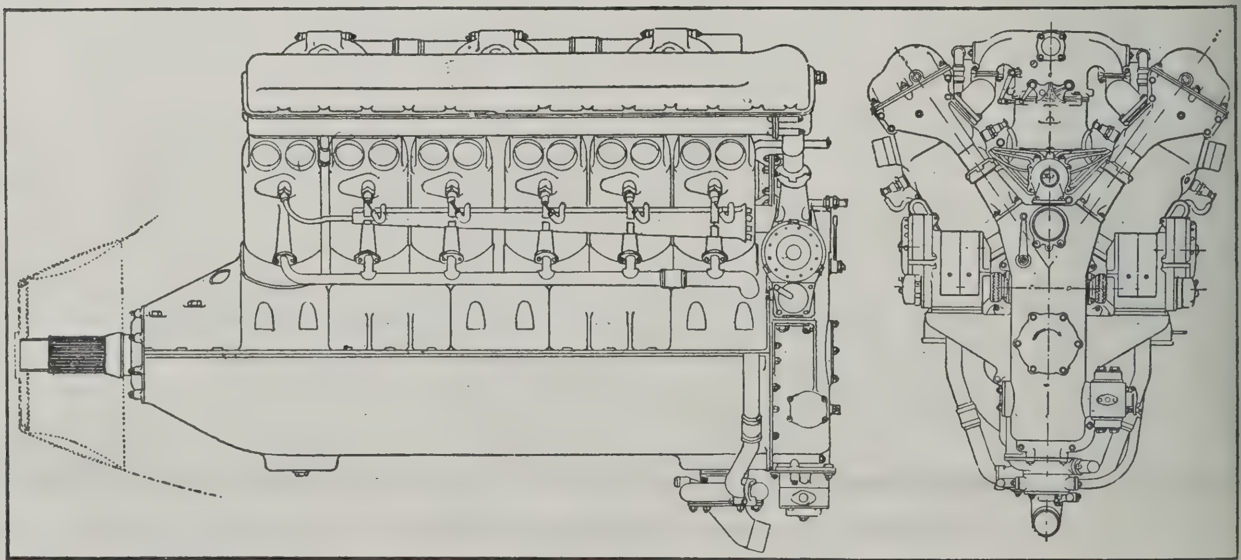
Valve Gear.—Camrings concentric with crankshaft and driven by spur gearing through a lay shaft. Valves operated by push-rods and rockers.

Pistons.—Light alloy castings—slipper type—with three rings. Hollow gudgeon pins locked in pistons by set-screws.

Connecting Rods.—Master rod and one half big-end in one piece. All rods H section. Plain big-end bearing.

Crankshaft.—One piece, one throw, with balance weights. Runs in three roller bearings and one double-ball thrust race.

Crankcase.—Light alloy casting, split and bolted together in plane of cylinders. Rear half of case has an annular induction chamber cast integral with it. Gears for magneto drive housed inside this



External general arrangement, Fiat A.S.III racing engine of 970 h.p.

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The AIRSCREW Co
WEYBRIDGE
SURREY

RELIABLE AND EFFICIENT AIRSCREWS

For the 2,500 miles air route operated by Imperial Airways Ltd., between Cairo and Karachi, the **HIGHEST DEGREE OF EFFICIENCY** in aircraft and equipment is absolutely essential. The airscrews are supplied by this Company also for the existing passenger services of Imperial Airways, in addition to **Sir Alan Cobham's recent Australian, Indian and South African Flights. The recent Hawker-Horsley Flight (Carr & Gillman), from Cranwell to the Persian Gulf, approximately 3,500 miles, used Airscrew Co.'s Propeller, which did NOT fail.**

THE AIRSCREW COMPANY,
WEYBRIDGE, SURREY.
Weybridge 705.

annulus. A separate, roughly conical casting bolted to front half of crankcase contains valve gear and cam-rings, carries tappet rod-guides, oil pumps, and front journal and thrust races for crankshaft.

MAGNETOS.—Two five-cylinder magnetos carried on inclined brackets at rear of engine.

LUBRICATION.—Two gear type oil pumps, one scavenger, one pressure, carried below cam-ring casing (in front of engine).

AIRSCREW DRIVE.—Direct. Airscrew hub mounted on taper end of crankshaft and driven by one key.

OUTPUT.—Nominal 100 h.p.

Note.—No dimensions or weights are available for this engine. All the information given above is derived from two small part sectional drawings reproduced in *Der Flug*, December, 1927.

The Skoda Engines.

The Skoda Works, who hold licences for the building in Czechoslovakia of Hispano-Suiza engines, have recently produced an engine of this design, of the three-row (broad Arrow) type which differs in material particulars from the standard French engine of the same type.

The main differences appear to be an increase in the stroke of the engine from 150 to 160 m/m., in the raising of the compression ratio, and in a reduction in the normal r.p.m. from 2,000 r.p.m. to 1,800 r.p.m.

This engine is made in a normal low-compression type and in a super-compressed version for high altitude service. The following data are drawn from *Letectvi*, of Dec., 1927:

There are twelve cylinders 140 m/m. × 160 m/m. The normal engine has a compression ratio of 5.5 to 1 and develops 450 h.p. at 1,800 r.p.m., with a maximum of 500 h.p. at 2,000 r.p.m.

The super-compressed engine has a compression ratio of 6.2 to 1, and develops 400 h.p. at 2,000 r.p.m., at any altitude up to 3,000 m. (10,000 ft.), and has a maximum output, at ground, of 570 h.p. at the same r.p.m.

Both engines, dry, weigh 404 kg. (889 lbs.). The fuel consumption per h.p. hour at rated output and r.p.m. is .23 kg. (.51 lbs.) per h.p. hour for the normal and .21 kg. (.46 lbs.) per h.p. hour for the supercompressed engine.

TECHNICAL ABSTRACTS.

Aerodynamics.

"Research on Channel Wall Interference." By J. H. Parkin, B.A.Sc., M.E., F.R.Ae.S., M.S.A.E., M.A.S.M.E. Aeronautical Research Paper No. 17 (Canada). Reprinted in Journal of the Royal Aeronautical Society, No. 204, December, 1927

An account of tests made in the Aerodynamic Laboratory of the University of Toronto to verify the accuracy of the Prandtl theory of Channel Wall interference. Instead of using models of different sizes in the same channel, each model was tested with a set of similar "mirror" models arranged around it. By varying the spacing of the mirror models the effect of various sizes and shapes of tunnel can be reproduced. Tests were made on cylinders and aerofoil models. The results show that wall interference increases the drag of a symmetrical body such as a cylinder, affects the lift and drag of an aerofoil in accordance with theoretical corrections, and give data for wall corrections on aerofoil tests for condition (i.e., aerofoil very large relatively to channel dimensions) beyond the limits of applicability of the Prandtl theory.

"Some Recent Experiments on Fluid Motion." (Paper by A. Fage, A.R.C.S., F.R.Ae.S., read before Royal Aeronautical Society, Jan. 5, 1927.

The author describes a series of researches recently carried out at N.P.L. These fall into two sections. The first deals with a comparison of the Viscous and Inviscid flows round the nose of an aerofoil. On general grounds it would be expected that for the same circulation and the same K_L the forward stagnation point in both viscous and inviscid flow would coincide. Experiment shows it does not except at one particular (low) value for K_L. The author suggests that the measured value of K_L in viscous flow is compounded of the K_L due to circulation corresponding to the actual stagnation point and a normal force on the aerofoil surface caused by the detachment from the aerofoil surface of the turbulent wake.

In the second part of the paper measurements of the flow behind a series of high-resistance bodies are described. The first section of this part deals with measurements of the extent and the vorticity of the vortex sheets shed from the edges of these bodies. These sheets have relatively sharply defined boundaries, with a nearly constant maximum velocity along their outer boundary, and a velocity gradually decreasing with distance down stream on their inner boundaries. The thickness of sheet increases with distance behind the obstacle.

In a second part measurements of flow in the vortex street into which the vortex sheets break up are described. These measurements tend to show that nearly 50 per cent. of the original vorticity of the sheet has disappeared by the time recognisable discreet vortices are formed. (At the same time the resistance of the body calculated by von Karman's theory from the vorticity at this stage agrees well with the actual resistance.

There are very marked divergences between the space relations of the vortices in the "street" and those indicated by von Karman's theory, but these are of a nature to be accounted for by the viscosity present in the fluid of experiment.

Airscrews.

"A New Type of Combined Airscrew Hub-Dynamometer and Thrust Meter." By Sq. Ldr. F. E. Hellyer, M.A., D.I.C., A.F.R.Ae.S. Journal of the Royal Aeronautical Society, No. 204, December, 1927.

Description of an instrument, a working model of which has been tested at the Air Ministry Laboratory. The airscrew is mounted on a hub floating on an extension of the engine shaft. It is driven through rollers bearing on helical cam faces of varying pitch coupled to the engine shaft. The pitch angle of the cam face at the position of equilibrium determines the ratio of thrust to torque and hence the efficiency of the airscrew. If a known force in the direction of thrust is applied to the airscrew hub, the hub will move to a new equilibrium position, and if the said movement is measured, a scale for both thrust and torque can be obtained. A simple practical form of hub in accordance with this principle is described.

Air Traffic.

"Der Deutsche Luftverkehr, 1927." (German Air Traffic, 1927). Nachrichten für Luftfahrer, Dec. 1, 1927.

Tabulated details of German air traffic for the months of January, February and March, 1927. Gives number of flights scheduled and completed, seating accommodation, available and occupied, and figures for passengers, passenger-kilometres, goods, mails, and ton-kilometres on each of 23 air routes of a total length of 7,841 km. (4,860 miles) in Germany for each month.

The total figures are:—January—1,112 flights scheduled, 641 completed; 7,729 seats available, 1,734 filled; 267,210 km. (165,000 miles) flown; 359,424 passenger-km. (223,000 passenger-miles); 28,921 kg. (28 tons) and 6,406 ton-kms. (3,960 ton-miles) of goods; 7,857 kg. (7¾ tons) and 1,473 ton-kms. (930 ton-miles) of mails.

February:—1,081 flights scheduled, 803 completed; 8,785 seats available, 2,722 filled; 298,068 km. (184,000 miles) flown; 555,424 passenger-km. (345,000 passenger-miles); 43,533 kg. (42 tons) and 9,345 ton-kms. (5,800 ton-miles) of goods; 9,857 kg. (9½ tons) and 1,894 ton-kms. (1,170 ton-miles) of mails.

March:—1,221 flights scheduled, 1,179 completed; 12,233 seats available, 5,701 filled; 412,875 km. (256,000 miles) flown; 1,171,500 passenger-km. (727,000 passenger-miles); 82,183 kg. (82 tons) and 166,675 ton-kms. (103,500 ton-miles) of goods; 19,639 kg. (19 tons) and 4,138 ton-kms. (2,560 ton-miles) of mails.

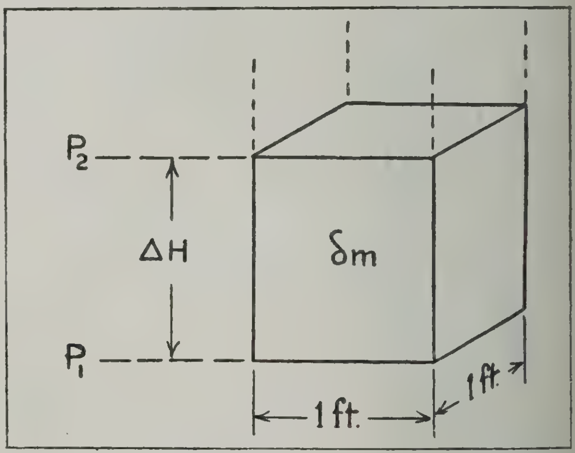
Note.—Figures for seats available and filled seem to refer to seat-stages; that is one seat on a journey made in three stages would count as three seats.

Climb Testing.

"A Proposed Standard Procedure for Computing Flight Test Climb Data." By L. V. Kerber. (See New Technical Literature.)

In the column of air shown in the fig. let ΔH be the height of the column in feet. Let the mean mass density of the column be δm. Then the pressure at P_1 is greater than at P_2 by an amount equal to the weight of the column.

$$P_1 - P_2 = \Delta P = \delta m \, \Delta H \qquad (1)$$



Dividing by Δt and transposing,

$$\frac{\Delta H}{\Delta t} = \frac{\Delta P}{\Delta t} \cdot \frac{1}{\delta m} \qquad (2)$$

In the limit $\dfrac{dH}{dt} = \dfrac{dP}{dt} \cdot \dfrac{1}{\delta m}$ (3)

Here $\dfrac{dH}{dt}$ is a true rate of climb and not a climb in an arbitrary standard atmosphere. From readings of an aneroid calibrated for pressure plot time to definite pressures against pressure, find slope of curve at various pressures and divide by the mass density of each pressure to get true rate of climb. Mass densities are of course obtained from the temperature reading of each particular pressure.

Engines.

"Fuel Consumption of Fairchild-Caminez Cam Engine."

Very low fuel consumptions are claimed for this engine, which is built by the Fairchild-Caminez Engine Corporation of Farmingdale, Long Island, N.Y. According to the power curve of the Model 477C type engine (4-cylinder air-cooled, 135 b.h.p. at 1,000 r.p.m.), the specific fuel consumption at 725 r.p.m. and 55 b.h.p. falls to .46 lbs. per b.h.p. hour.

Flight tests made on a Waco Ten biplane cruising at approximately

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80 m.p.h. and 725 r.p.m. for seven hours gave an average hourly consumption of 4.6 (American) gallons, equal to about 3.8 Imperial gallons, per hour, which, assuming that the actual b.h.p. was 55 in this test, is between .5 and .52 lbs. per h.p. hour.

A more extended flight of seventeen hours on the same machine showed an hourly consumption of 4.9 American (4.1 Imp.) gallons per hour.

The Fairchild-Caminez Cam engine—(see The Aeroplane, June 9, 1926), is a four-cylinder radial air-cooled engine in which the crankshaft is replaced by a two-lobed cam. Rollers on the pistons bear on this cam and are kept in contact therewith by a link gear interconnecting all four pistons. Each piston is thereby constrained to make four working strokes per revolution of the cam-shaft, instead of two with the usual crankshaft. The cam gear thus serves the purpose of a two-to-one reduction gear plus the ordinary crank-shaft and connecting rods assembly.

"The Heywood Injector Starter." (*Aviation, Dec.* 12, 1927.)

The Heywood starter consists of a small engine-driven air compressor, an air storage tank of 6-10 cub. ft. capacity, an auxiliary carburettor, a distributing valve, and non-return valves admitting to the engine cylinders. To start an engine with this starter, air from the tank is admitted via the distributor to a cylinder on the power stroke, and starts the engine rotating.

Simultaneously air from the same source which has passed through the auxiliary carburettor and is charged with fuel vapour is admitted to another cylinder on the compression stroke. This injected charge is fired by the normal ignition gear at the normal firing point. The weight of the complete starter is said to be 27 lbs.

Seaplanes.

"Seaplanes. Fifteen Years of Naval Aviation." By Gen. A. Guidoni. (Journal of the Royal Aeronautial Society, Jan., 1928.)

In this article the author gives an account of experimental work—dating from 1908—carried on by himself. In the main this related chiefly to the development of seaplane floats and hulls fitted with hydrovanes instead of the usual planing bottoms and steps.

Gen. Guidoni claims that this type of float has many marked advantages, permits of lighter float construction, lower head resistance, and better take-off conditions than can be achieved by conventional floats. (This contention is supported by experiments made in Britain during the war with hydrovane gears for emergency water alightings by land-machines.—Ed.)

Some curves and other data of the water performance of hydrovane floats are reproduced in the paper.

NEW TECHNICAL LITERATURE.

Aircraft Compasses.

"Le Bussole per L'Aeronautica." Aeronautica (Venice) Nov. 4, 1927.

Descriptions and illustrations of aircraft compasses, including the Smith Aperiodic, the Salmoiraghi Model 10, the Pioneer (Salmoiraghi type), the Avio, the Ludo types F.K. 6N. 1506 and F.K. 10-11N. 1510-11, the Franz Model 26, the Emil and the Morel.

Aircraft Design.

"Note Techniche sugli Idrovolanti Mettalici Commerciali." By Ing. Alberto Grandinetti. Aeronautica (Venice), Nov. 4, 1927.

Discussion of the detailed structural design of a projected all-metal flying-boat with two 500 h.p. engines mounted in tandem. The machine in question is intended to carry 12 passengers and a crew of two, and to have a range of 700 km. (430 miles) at a cruising speed of 175 km.h. (110 m.p.h.). Figures showing general arrangement, hull profile, and construction of box-type metal spars and fittings, are given.

Air Surveying.

"Simple Methods of Surveying from Air Photographs." By Lt. M. Hotine, R.E. (Professional Papers of the Air Survey Committee, No. 3). *Published by H.M. Stationery Office,* 3s. 6d. net.

Account of an experimental Air Survey of 20 sq. miles near Arundel, and of the methods used for compiling an accurate contoured map with the minimum possible ground control. The section of country in question would be expensive to survey by ordinary surface methods, and being hilly presents distinct difficulties as to contouring by aerial methods.

The method used for plotting in this case depends on an intersecting subsidiary control in the overlap of the first pair of photographs in a strip, and the use of this intersected control to resect the position of the next photograph, a general principle already well-known. Full details of the process are given. Contouring from the photographs was carried out, with the aid of a relatively small number of "spot" heights determined on the ground, by stereoscopic examination of overlapping prints.

Comparison of the map so produced with the Ordnance Survey map shows a remarkably high degree of accuracy in the results attained.

Airships.

"Secondary Stresses in Airship Hull Structure." By J. F. Baker, M.A. Journal of the Royal Aeronautical Society, No. 204, *December,* 1927.

An analysis of the local stresses in the framing of a rigid airship caused by variations in the distribution of applied loads, such as the application of external loads otherwise than at the joints. Approximate methods for practical use are developed.

Bomb-dropping.

"Contributo allo Studio del Problema: Lancio delle Bombe da Velivoli. (A contribution to the study of the problem of Bomb-dropping from Aircraft. By Col. Giovanni Bruno. Rivista Aeronautica, Nov., 1927.

An investigation of the trajectory of a bomb dropped from an aircraft, leading to a method of calculating the lag, the angle of lag, the time of fall and the velocity at impact. Illustrated by completely worked examples for one particular bomb.

Testing Aeroplanes.

"A Proposed Standard Procedure for Computing Flight-Test Climb Data." By L. V. Kerber. Circular Series, No. 1, *of the Department of Engineering Research, University of Michigan, U.S.A. Price* 25 *cents.*

Results of climb tests on aircraft deduced from aneroid and thermometer readings are usually presented in terms of apparent rate of climb against height in an arbitrarily fixed "standard" atmosphere. There is no international agreement as to the qualities of this "standard atmosphere," and different countries use different standards. Hence the results of climb tests made in different countries using different "standard" atmospheres are not comparable, and not even convertible to comparable terms unless the whole of the original test data is available.

The author proposes a method of deducing true rate of climb from pressure, temperature and time data, and plotting this preferably against density. This true rate of climb may be plotted against "standard" height however if that is desired, for there is no difficulty in translating "standard height" in any one known standard atmosphere back into density and thence again into "standard" height in any other standard atmosphere. (See Technical Abstract.)

"A Manual of Flight Test Procedure." By W. F. Gerhardt, revised by L. V. Kerber. Engineering Research Bulletin No. 9 (*December,* 1927) *of the Department of Engineering Research, University of Michigan, U.S.A. Price* $1.

The author of this little book was at one time Chief of the Flight-Test Research Unit of the U.S. Army Air Corps at McCook Field, and Mr. Kerber is Guggenheim Professor of Applied Aeronautics at the University of Michigan.

The book contains a short introductory section setting forth the objects for which flying tests of aircraft are made, and includes a strong plea for the international standarisation of methods of making such tests, types of instruments used, and methods of presenting the results when obtained.

The main portion of the book contains a detailed account of a flying test procedure suggested as suitable for standardisation in this way. This section gives accounts of all instruments to be used, of the methods of calibrating them, of the actual process of making tests, and of the reduction of test results to their final form.

In view of Mr. Gerhardt's experience of practical testing work his opinions on this subject are necessarily worth attention. And there is much reason in the plea for a greater uniformity of both methods of testing and the presentation of results.

Journals.

"The Journal of the Royal Aeronautical Society," No. 205, *Vol. XXXII, January,* 1928. *Price* 2s. 6d. *net.*

Contents:—Official Notices. Report of Special General Meeting. Paper by Sq. Ldr. T. W. England, "The Practical Side of Performance Testing of Aircraft. Article by Gen. A. Guidoni, "Seaplanes" (see Technical abstracts). Report of Informal Discussion, "Are Aero-Engines Reliable?" Correspondence, Branch Notices, Book Reviews.

"Rendiconti Tecnici della Direzione Generale del Genio Aeronautica," December, 1927. *Published by the Ministry of Aeronautics, Rome.*

Contains a short essay on the stressing of wire-spoked wheels for aircraft entitled *"Il Calculo delli Ruote degli Aeroplani,"* by Major Aldo Guglielmetti and Ing. Luigi G. Ferrari.

"Notiziario Tecnico di Aeronautica," December, 1927. *Published by the Ministry of Aeronautics, Rome.*

This number contains abstracts in Italian of a number of reports drawn from among those recently issued by the Aeronautical Research Committee, the National Advisory Committee for Aeronautics (U.S.A.), the Section Technique de l'Aeronautique (France), and *précis* of two articles in *Aerotechnica* by Prof. Pistolesi, one on the Theory of Airscrews and one on Detonation.

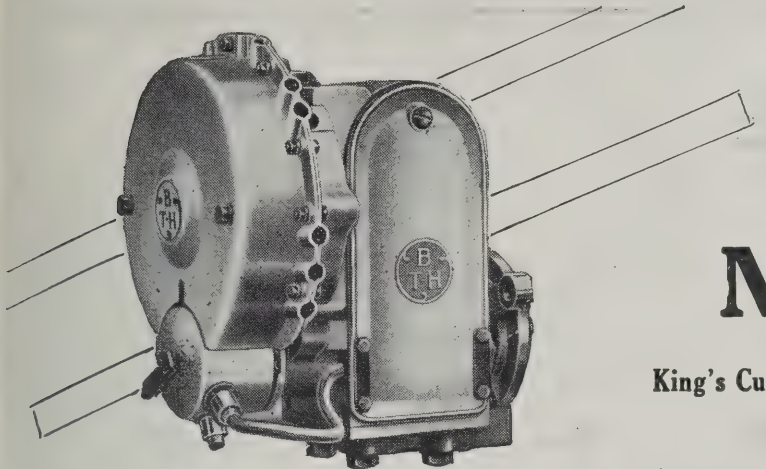
Wireless.

"Rotating-loop Radio Transmitters, and their Application to Direction-Finding and Navigation." By T. H. Gill and N. F. S. Hecht. (Paper read before Inst. Electrical Engineers, Jan., 1928.)

Describes the development of a wireless beacon for aircraft by the Air Ministry at Biggin Hill and Farnborough. The beacon consists of a loop aerial, rotating steadily at one r.p.m. This aerial transmits a steady signal, interrupted to give the call sign of the station, an indicating signal, when the axis of minimum radiation of the loop is true North and South, and a warning signal to prepare the observer for this signal.

The observer on an aircraft has to listen for this North signal and start a stopwatch at the instant it is received. He stops the watch on receipt of the minimum signal. The number of seconds shown on his watch, multiplied by six, is his bearing in degrees from the beacon.

Tests made from aircraft with this beacon gave very satisfactory results.



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THE "AEROPLANE,"
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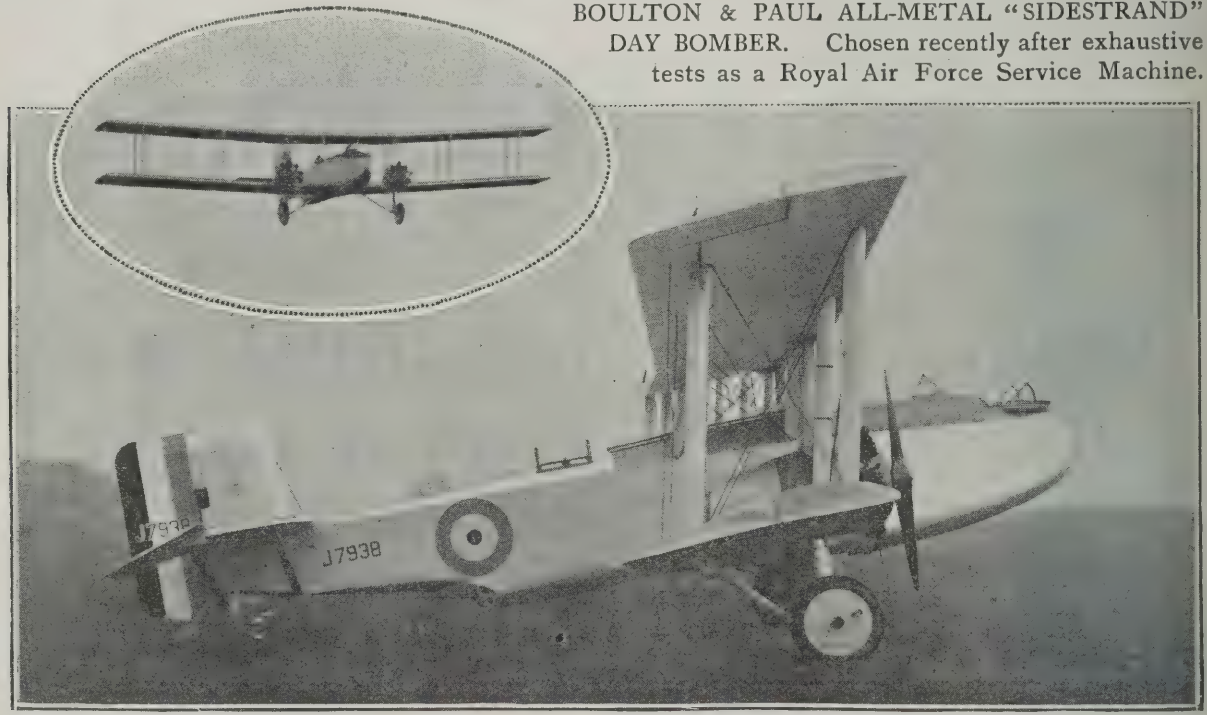

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THE NEW REVOLT IN THE DESERT.

The latest " Revolt in the Desert," the entirely illicit raids Feisal ed Dowish on the innocent 'Iraquis, in defiance of r old friend Ibn Saud, is very much the affair of the yal Air Force. And one hopes that the R.A.F. in 'Iraq is now dealing faithfully with that truculent chief. Probly most of the R.A.F. people in 'Iraq understand the litical situation fairly well, but for the benefit of the A.F. elsewhere in the British Empire, and for the benefit our Service friends in the States, there seems good reason publish a clearer explanation of the affair than has peared in the daily papers.

In the first place, Ibn Saud, Sultan of Nejd, an area which s between Aden and the Persian Gulf, was, during the ar 1914-18, subsidised by us to make himself unpleasant to e Turks. As a matter of fact he did very little, because actically all the real work against the Turkish Army was ne by Feisal, now King of 'Iraq, as related very fully in lonel Lawrence's " Revolt in the Desert," and perhaps ore clearly in Mr. Graves's " Lawrence and the Arabs."

Ibn Saud, besides being Sultan of Nejd, is chief of the ahabi sect, who are to the ordinary Mahomedan what omwell's Puritans were to the ordinary Englishman. But, parently, ambition is not a sin to Puritans of any kind. nsequently he made his puritanism an excuse for going war with King Feisal's father, Hussein, King of the edjaz, and recently conquered that Kingdom, and occupied e holy cities of Mecca and Medina. And he finally turned t from the Hedjaz Hussein's son Ali, who had been elected ing in Hussein's place.

Ibn Saud has frequently made war on Hussein's other son, dulla, Emir of Transjordan, and he is by no means iendly with King Feisal of 'Iraq, for he dislikes Hussein's iole clan. But as nothing succeeds like success, the itish Nation now recognises Ibn Saud as King of the ejaz and Nejd, and we are supposed to be on quite friendly rms with him and all good Wahabiis.

So far as Feisal ed Dowish is concerned, the situation is cellently put by a writer in *The Army, Navy and Air Force zette* as follows :—

THE DESERT WAR.

hat stern and acquisitive reformer, Sheikh Feisal ed Dowish el itairi, whose predatory raids on the marches of 'Iraq and Koweit ve been causing complaint for some weeks past, has now really cceeded in making trouble. As was pointed out in these columns a tle while ago, his misbehaviour was not inspired by his sovereign, e Wahabi King, and those who feared that they might have to lay e blame for the raids upon the Court of Riyadh will doubtless be ieved to find that His Wahabi Majesty is as much annoyed with peccant subject as are his injured neighbours. It has been stated at King Abdul Aziz Es Saud has decided to use armed force ainst his vassal in co-operation with the just retaliation which is oposed from the 'Iraqi side.

his would sound hopeful, the more so as Ed Dowish's domestic adquarters at Artawiyah is only two days' march for camelry from walled town where the Wahabi King is believed to have a small ce at his disposal, were it not for the fact that the Royal authority somewhat circumscribed in that area by conditions which may described briefly. The area in question is ordinarily dominated two powerful tribes, the Ateibeh and the Ajman. The former of ese is believed to be sympathetic towards the Mutair which is pplying Ed Dowish with his fanatical braves. The latter is finitely unfriendly to the Wahabi King.

welve years ago it was the sudden defection of the Ajman, ributed, not perhaps unjustly, to the effect of Turkish gold, which to the Wahabi leader's defeat at Jarrub, remembered in this untry as the battle in which the talented Captain Shakespeare lost his life. A year later it was the Ajman who slew Ibn Saud's brother, and, while the Wahabi King has avenged himself upon the Shammar, his other opponents at Jarrub, by obliterating their independence and imprisoning their Emir, he has so far only been able to patch up a grudging *modus vivendi* with the Ajman, with which he has every justification for cherishing one of the traditional blood-feuds of his country. Of this the Ajman is perfectly aware and is consequently unwilling to take any action against the neighbouring Mutair which might tend to enhance the power of His Wahabi Majesty in an area where it is at present somewhat nominal lest, having supported him in one more application of the policy of *divide et impera*, which he has found so successful in the past, he might be tempted to remember that the blood of his brother still calls to immemorial tradition for vengeance.

In these circumstances the courteous assurance from Riyadh that the Wahabi King disclaims responsibility for the misdeeds of his unruly vassal and proposes to co-operate with any Anglo-'Iraqi measures which may be taken against him is somewhat of the nature of a sigh of relief. If the Wahabi King cannot rely on the loyalty of the Ateibeh and has good reasons for fearing renewed treachery on the part of the Ajman it will be as difficult for him to take effective action against the Mutair as it was for a mediæval King of England to crush a rebel when the neighbouring Earls could not be trusted to take the field on the Crown's behalf against him.

In order to strike effectively at the Ed Dowish it seems, in existing conditions, that the Wahabi King might have to send a force of his redoubtable settled Arabs from the centre of his dominions up into tribal territory and embark on one of those desert campaigns of the old style which were so tedious, so costly, and often so ineffective. It must, therefore, be eminently gratifying to the Court of Riyadh to learn that a blow is to be struck at the rebel Sheikh by a force independent alike of the goodwill of jealous tribes and of some of the more hampering conditions of old-style desert campaigning.

Meanwhile, Ed Dowish may take credit to himself for having been the last straw which broke the back of Jafar Pasha el Askari's moribund Cabinet in 'Iraq. Without the prospect of having to finance a punitive expedition out of a deficit, the late Ministry might have filled its vacancies and settled down once more in the saddle, but, as it is, Jafar Pasha has decided to allow a successor to have the glory, as we hope, of reporting the first victory of the arms of 'Iraq over a foreign and cruel foe and also the less grateful task of persuading the 'Iraqi taxpayer to foot the bill for it.

That section of the British public which adheres to that strange form of political Manichæism under which the part of the Evil Principal in this world is perpetually played by the British Empire, should reflect before espousing the cause of Sheikh Feisal ed Dowish too enthusiastically. The man will, of course, deserve support because British forces are about to take either the air or the field (or both) against him. But it would be well to remember that he has perpetuated at the expense of a helpless tribe of unarmed native shepherds the quite recent, but very evil, Wahabi practice of slaughtering opponents on, it is supposed, purely religious grounds.

Until a very few years ago Arab warfare was a fit sport for hard-riding gentlemen and public opinion frowned upon anyone who carried it to such an extreme as to kill an opponent. Of course, accidents did happen and excitable young men were occasionally carried away into deplorable indiscretions which plunged whole families into mourning; but, as History abundantly shows, most of the more important battles in Arabia shaped the destiny of that immense peninsula with death-rolls restricted to double figures.

The introduction by Wahabi fanatics of a policy of frightfulness may have been necessary in the first instance, in their own opinion, in order to purge the land of false brethren, drinkers of coffee, smokers of tobacco, and men who shaved their chins, but it will be regarded by most people as unreasonable that such methods should be perpetuated by a truculent Arabian Ironside who has removed his neighbour's landmark, persecuted widows and orphans, after murdering their husbands and fathers, and is guilty, moreover, of rebellion against his own austere, most devout and anointed King, an offence which used to be classed very properly with the sin of witchcraft.

DE HAVILLANDS IN CANADA.

The de Havilland Aircraft Company Ltd., of Stag Lane rodrome, Edgware, announces that a branch organisation ll be opened in Canada on March 1.

The headquarters will be at Toronto and a small factory ll be set up at Leaside aerodrome about four miles outside e city. At first the Canadian branch will act as a service ition for the many Moths which are already operating in e Dominion and as an assembly depot for machines shipped om this country. Later it is possible that certain comnents may be manufactured locally.

The Canadian branch will be managed by Mr. R. A. Loader, io has been associated with the de Havilland Company as sistant Business Manager for over four years. He is taking th him a small staff of expert aircraft mechanics to form e nucleus of personnel for the new branch, which will, in probability, be registered as a separate company with the le : The de Havilland Aircraft Company of Canada, Ltd.

The decision to establish a local factory has been taken as result of a visit recently made to Canada by Mr. F. E. N. Barbe, the Business Manager of The de Havilland Aircraft mpany, who was greatly impressed by the vast service ich light aeroplanes can render to the Dominion for mail nsport, air survey, forestry protection and private travelg. It is expected that considerable economy will be effected distribution from Toronto.

CIVIL AVIATION IN SPAIN.

The Spanish Government has decided to give one Spanish company a concession for all air lines over Spain. The company will be under State inspection in regard to material, air traffic, and administration. All machines and engines used by the company must have been constructed in Spain, and all the members of the board of directors, and all the more important employees of the company and the flying and technical *personnel* must be Spanish.

The concession is to be granted for a maximum period of 12 years, and the Government will provide a minimum yearly subsidy of 1,500,000 pesetas (£51,700) for the air routes. The paid-up capital of the company must be at least three times the amount of the total Government grant. Shares in the company may be held only by Spanish subjects.

At the present time there are two Spanish companies running air lines in Spain and receiving subsidies from the Spanish Government. There is also an extension of the German Lufthansa service running a daily passenger service between Madrid and Barcelona. The French Compagnie Latécoère has intermediate landings on its Toulouse-Rabat line at Barcelona and Alicante.

The fact that the Spanish Government is able to nationalise its civil aviation is testimony to the increase of efficiency brought about by the Marquès de Estella and the now-defunct Directory.

ADDITIONS TO THE CATERPILLAR CLUB.

The membership of the Caterpillar Club was recently augmented by Lieut. C. B. Whitney, Air Corps Reserve, and Staff-Serjt. Paul L. Woodruff, 91st Observation Squadron, Cressy Field, Calif. A report received from Cressy Field states that on July 13 while Serjt. Woodruff was piloting a D.H. airplane at an altitude of 800 feet over the 104th Division Training Camp at Salt Lake City, Utah, with Mr. Whitney as observer, the aileron control wire broke in the cockpit, rendering the plane minus its lateral control. For 15 minutes thereafter the pilot kept his plane under control and managed to gain a safe altitude for using the parachute. At 2,000 feet, upon a signal from Sjt. Woodruff, Mr. Whitney jumped with his parachute, but the loss of his weight from the rear seat caused the nose of the airplane to tilt down and head for the ground, rendering the pilot's task of extricating himself particularly difficult.

Serjt. Woodruff displayed great coolness and presence of mind by closing the ignition switch to avoid the danger of fire, and he managed to clear the ship when only about 500 feet from the ground. His parachute opened just in time to break his fall and he was considerably shaken on landing.

Four other parachute jumps have been noted recently. The California National Guard now boasts of at least two members of the famous Club. Capt. H. J. Cooper and Lieut. Eldo Peterman, members of the 115th Observation Squadron, 40th Air Corps Division, California National Guard, watched the training plane which they had been piloting fall from an altitude of 5,000 feet as a result of the collapse of one of the wings. Both flyers took to their parachutes and landed simultaneously within a few hundred yards of their plane.

On the night of July 5, 1926, the Nashville Aeronautic Corporation, as their part of the 4th of July celebration, attempted to give the people of Nashville aerial fireworks. Captain Walter M. Williams, of the Tennessee National Guard Air Corps, was piloting a Waco-9 plane and 2nd Lieut. John W. MacKenzie, of the same organisation, was shooting the fireworks.

While the aviators were about 5,000 feet over Nashville, two star shells were fired when, in some unknown way, a shell went off in the front cockpit and set the whole basketful of fireworks on fire. The aviators were forced to leave the burning plane and both made safe landings with their parachutes.

Mr. MacKenzie's clothing was on fire when he jumped, and several holes from 6 to 8 inches in diameter were burned in his parachute, yet he made a safe landing and walked several hundred yards before anyone got to him and put out his burning clothes. On his way to hospital he remarked—" I now belong to the Caterpillar Club." His burns were so severe, however, that he died several days later.

Capt. Williams' clothes and chute cover were burnt, but they did not blaze. He came down through the outer edge of a tall walnut tree. The parachute lapped over the top of the tree and stopped him very gently within four feet of the ground.

According to available records, sixty emergency parachute jumps have thus far been made and 54 lives saved. So far as is known, there are now 49 living members of the Caterpillar Club—some of whom have made more than one jump. Col. Charles A. Lindbergh holds the record with four emergency jumps.

THE BERMUDA—AMERICA FLIGHT.

The following letter has been received from Major H. Hemming of The Aircraft Operating Co. Ltd., and one commends it to the attention of the British Aircraft Industry :—

Sir,—I have received a letter from Mr. J. P. Hand, the Chairman of the Bermuda Trade Development Board, whom I used to know in Bermuda, and who was a very strong supporter of Civil Aviation in the days of the Bermuda and West Atlantic Aviation Company, with which I was associated.

Mr. Hand refers in his letter to the Bermuda Air Safety Competition between the Colony and New York, which will be open from Feb. 1 to Aug. 1, and he writes as follows :—

> " A number of us here are most keen to secure a British entry, and having regard to the expense of getting a plane to America I feel sure that I could raise a sufficient amount locally to assist in this connection.
>
> " I have in mind at the moment raising £1,000 to add to the £2,000 offered by the Bermuda Government, in the event of the contest being won by a British entrant.
>
> " I would appreciate tremendously your interesting yourself in this matter, as I feel that British prestige in this part of the World is at stake, and anything that I can do locally to induce one of your good airmen to enter in this contest will be done."

I shall be glad if you could bring Mr. Hand's sporting offer to the notice of your readers. I can assure any prospective entrant that he will receive a very hearty welcome in Bermuda, as Bermudians are known all the World over for their hospitality.

This attempt on the part of Bermuda to encourage the establishment of air communication with the mainland is of special interest, as I believe I am right in saying that Bermuda was the first Colony to pass a private Bill in connection with the development of Civil Aviation. There is no doubt that when air transport becomes fully established, Bermuda will be an important air port, on account of its geographical position.

Yours faithfully,
(Signed) H. Hemming (Managing Director),
The Aircraft Operating Company Ltd

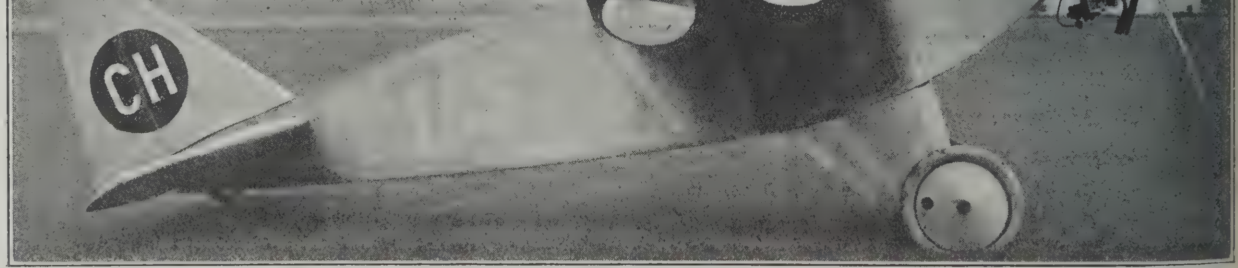
AN ANGLO-BRAZILIAN AVIATION COMPANY.

All arrangements have now been concluded for an aircraft factory to be set up in Rio de Janeiro, to undertake the building of aeroplanes and seaplanes in Brazil.

This company, which is to be called *A Companhia Naçional de Navegaçao Aerea,* has been formed by an arrangement between the Blackburn Aeroplane and Motor Co. Ltd. of Leeds, who are represented in South America by Brig.-Gen. Francis Festing, C.B., and the *Companhia Naçional de Navegaçao Costeira.* The latter is the largest engineering concern in Brazil, and claims to be the biggest ship-construction yard in the Southern Hemisphere.

The workshops of this company are situated on an island in the Bay of Rio de Janeiro, the Ilha do Vianna, and it is here that the *Companhia Naçional de Navegaçao Aerea* is to begin its activities. Later on another factory will be constructed on the Ilha de Engenho, also in the Bay of Rio. Senhor Henriqué Lage, the owner of the *Companhia Naçional de Navegaçao Costeira,* has always displayed an intense interest in the Science of Aviation and is himself the owner of a Blackburn aeroplane.

The machinery for this factory is due to arrive in Brazil early in the new year, and the company will be ready to execute orders of any kind, size or description by the middle of 1928.—V. C. Middleton.



THE KORSA I MONOPLANE (50 h.p. Anzani engine) an interesting Swiss sporting machine. A description appears on page 106.

FAMOUS AIRCRAFT

USING A AND P COLD DRAWN WELDLESS STEEL TUBES

he "Westland Widgeon," an ideal light 'plane for private wners, club use, etc Fastest to finish in King's Cup Race, 927 First in Queensland Aerial Derby Speed Champion up, Nov. 1927
tout undercarriage with steel springs and Ferodo dampers
Vings braced with struts, without rigging, fold alongside ody for garaging in small spaces
arasol construction gives pilot and passenger an excellent view
etrol consumption—20 m p g, and touring speed 80-90 m p h
upplied with British Air Ministry Aerobatic Certificate

A and P Tubes are used

ACCLES & POLLOCK LIMITED

OLDBURY BIRMINGHAM

How Aircraft Tubes are Made

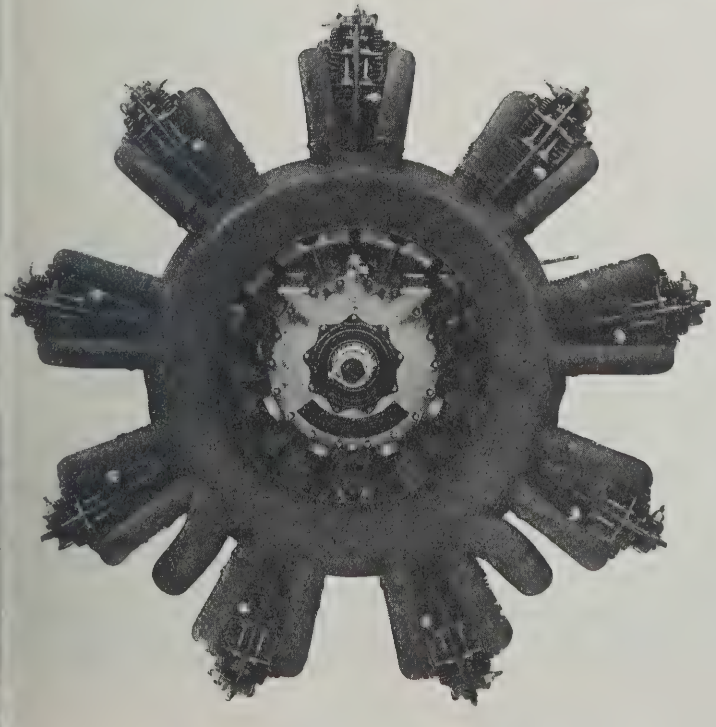
3—DRAWING

The "blooms" are now ready to be shaped into tubes of the required diameter, gauge and section, which is done by the operation called "Drawing" A draw-bench is used for this purpose, having at the one end a wheel on which an endless chain works; at the middle, a die-holder, in which a hardened steel die, of the requisite diameter, is fixed; and at the other end a rod or plug (according to the class of work being done) The tube is first put over the rod or plug, the last-named being arranged so as to come immediately under the centre of the die, with the wall of the tube between Then the tag end of the tube is fed through the die and is gripped by a "dog" fastened to the endless chain, the wheel revolves and takes the chain with it, so forcing the tube through the die and reducing its outside diameter to the size of the die, and its inside diameter to the size of the rod or plug which is inside it The operation of Drawing hardens the surface of the tube, and before it can be put through another die to reduce it further, the tube has to be annealed

The annealing is done in a suitable furnace, after which the tube is "pickled" in acid to remove scale and washed in water to clean off the acid

This procedure is repeated until the tube is brought to the dimensions required

Bristol



The Jupiter engine is in service in every European country, in Africa, in Australia, in Asia and in America.

The efficiency and economy of the Jupiter is supplying an impetus to aviation development.

THE BRISTOL AEROPLANE CO., LTD.
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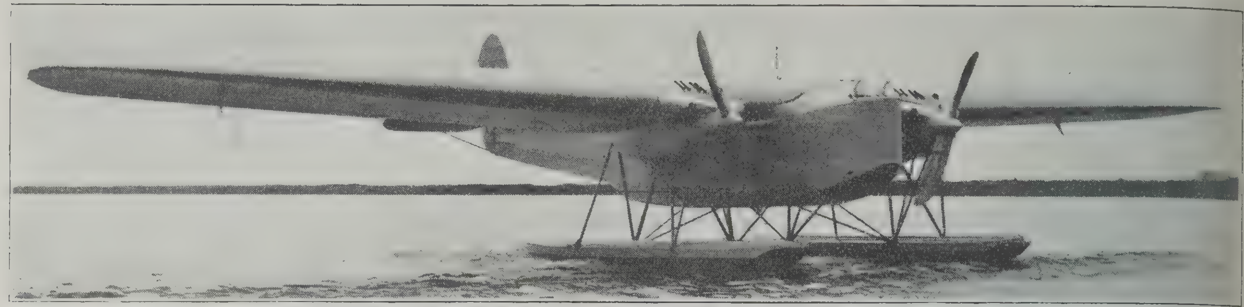


THE FOKKER T.IV SEAPLANE (two Lorraine-Dietrich engines, 450 h.p. each) which is described on page 104.

SIR ALAN COBHAM'S PROGRESS.

Sir Alan Cobham, K.B.E., whose African Survey flight on a Short Singapore has been delayed at Malta, left Malta on Jan. 21 and arrived at Bengazi, where the machine was re-fuelled. On Jan. 22 he flew to Tobruk. On Jan. 23 he arrived at Abukir.

AIRCRAFT FINANCE IN THE STATES.

The American Railway Express Company have recently announced a trans-continental air baggage service. The four companies to carry express parcels are the National Air Transport Company, Boeing Air Transport, Western Air Express and Colonial Transport. The American newspaper which makes the announcement states that these firms have between them about seventy-five aeroplanes, making a total investment of 1,500,000 dollars.

The same paper states that there is already a small amount of stock in aircraft firms in the hands of the public, and that the surprising growth in aircraft development in the States has caused conjectures in Wall Street as to whether there is an impending era of aeronautical financing comparable to that which started when the automobile was developed. Obviously such a state of affairs must happen some time or another. The only question is, when?

From a British Columbian paper one learns on the authority of Mr. Ernest Eve, of Eve Brothers, Ltd., Victoria, B.C., that the capitalists of Detroit are offering to finance the manufacture of good aeroplanes, of which there is a scarcity at the present time, as nearly all factories are overcrowded with orders for the next three months.

Is the British Aircraft Trade going to compete with the American Trade for the Canadian business, or is it not?

FOR GOOD ALUMINIUM.

Dirt has been defined as matter in the wrong place. And when one has on occasion in this paper referred to aluminium as electrified dirt one has done so definitely with the idea that aluminium and its various alloys are frequently used by engineer-designers in wrong places. There are a good many places in aircraft in whic aluminium can not only be used justifiably but in which nothin but aluminium or its alloys will do the job under the limitation of weight which are necessary.

Among the various firms who specialise in producing the bes kind of aluminium work are Rowland Hill and Sons Ltd. of Kin Street, Coventry,—a firm which one knew well something over thirt years ago as producers of castings of the most reliable kind i various metals.

It was not until the year 1901 that one of the smaller shops c Rowland Hill and Sons Ltd. began its life as a miniature aluminiun foundry. This shop grew and grew until by 1916 the whole of th King Street works had been given over to the casting of aluminiur instead of iron, brass and bronze.

Rowland Hill's specialise on casting aluminium alloys to any specification, and guarantee that their casting will stand up to an analysis when it is produced in bulk. The firm are on the Ai Ministry list of those whose facilities for inspection and testin have received A.I.D. approval, and they have done a great deal o casting for aircraft firms. The accuracy of their work is indicate by the fact that one of the latest jobs which the firm has under taken has been the particularly fine aluminium castings needed fo the framework and lens holders of air cameras.—C. G. G.

MR. HAMILTON'S DEATH PRESUMED.

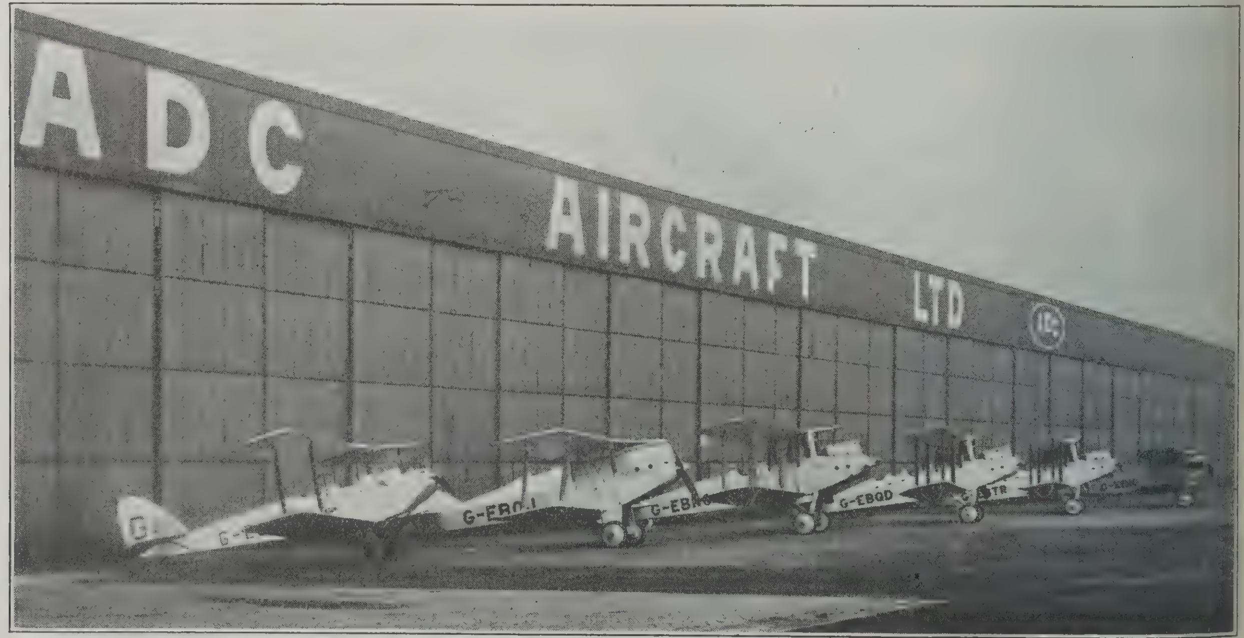
In the Probate Court on Jan. 23, Mr. Justice Hill granted ar application for leave to presume the death of Captain Leslie Hamilton who was the pilot of the aeroplane in which he attempted, with Lt.-Col. Minchin and Princess Lowenstein Wertheim, to fly from Upavon to Ottawa, on Aug. 31, 1927.

WHO INVENTED "AEROBATICS"?

From The Aeroplane *of January 1st, 1914.*

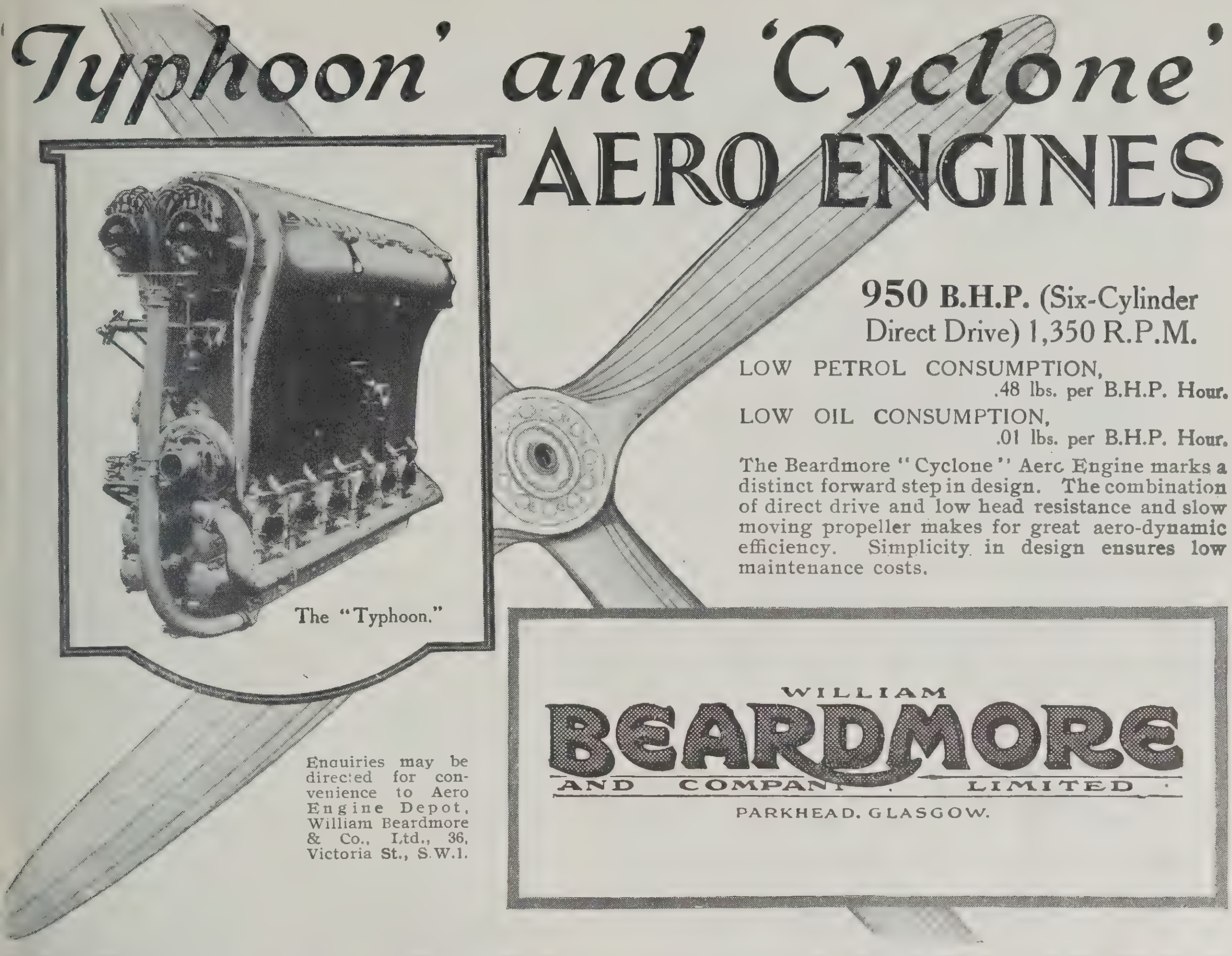
Nomenclature.

Mr. E. C. Gunston writes :—" Since *boucling* the *boucl* is a feat which has come to stay, and which apparently is as common as sane flying, these feats performed by Pégoud Chevillard, and certain other scientific gentlemen, will have to be called by a distinguishing name. Why not 'aerobatics'?"



("Aeroplane" photograph.)

THE A.D.C. AIRCRAFT CO.'S TRANSPORT FLEET AT CROYDON.—From left to right, a D.H. Moth (Cirrus engine), a Martinsyde (Nimbus engine) and four D.H.9s (Puma engines).



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AERO ENGINES

The "Typhoon."

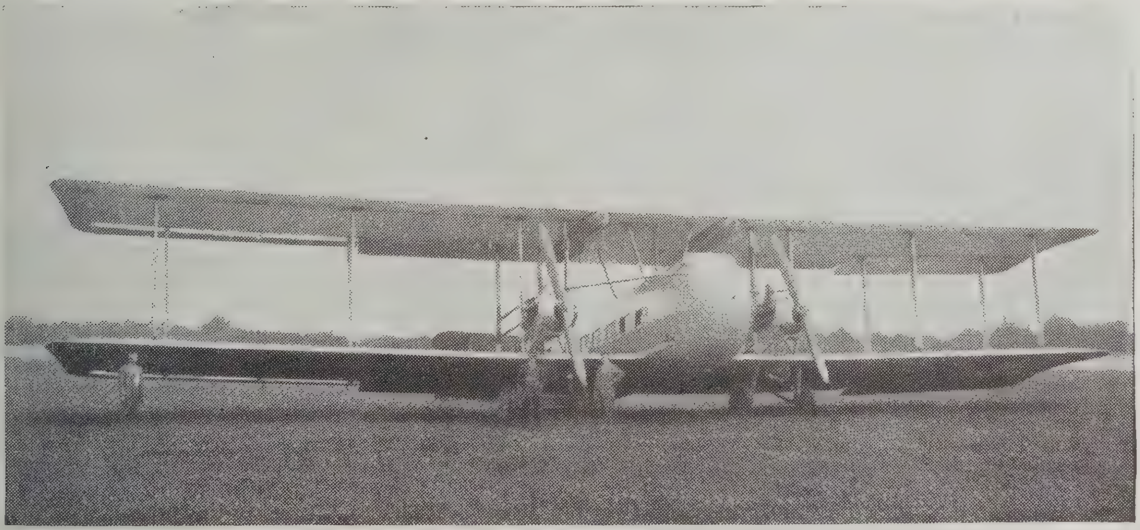
950 B.H.P. (Six-Cylinder Direct Drive) 1,350 R.P.M.

LOW PETROL CONSUMPTION, .48 lbs. per B.H.P. Hour.
LOW OIL CONSUMPTION, .01 lbs. per B.H.P. Hour.

The Beardmore "Cyclone" Aero Engine marks a distinct forward step in design. The combination of direct drive and low head resistance and slow moving propeller makes for great aero-dynamic efficiency. Simplicity in design ensures low maintenance costs.

Enquiries may be directed for convenience to Aero Engine Depot, William Beardmore & Co., Ltd., 36, Victoria St., S.W.1.

WILLIAM
BEARDMORE
AND COMPANY LIMITED
PARKHEAD, GLASGOW.



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THE FLYING CLUBS.

THE GENERAL COUNCIL OF FLYING CLUBS.

A meeting of the General Council of Associated Flying Clubs was held at the Royal Aero Club on Wednesday, Jan. 18, attended by representatives of the Royal Aero Club, the Bristol and Wessex Aeroplane Club, the Halton Aero Club, the Hampshire Aero Club, the Lancashire Aero Club, the London Aeroplane Club, the Newcastle-on-Tyne Aero Club, the Nottingham Aero Club, and the Yorkshire Aeroplane Club.

The following dates for Aviation Race Meetings in the Provinces were approved :—

Bristol Saturday, May 5, Hamble Monday, May 28, Castle Bromwich (Birmingham) Saturday, June 9, and Northern Area (place not yet fixed) Saturday, July 7.

These dates are subject to the completion of satisfactory arrangements with the Air Council, for official participation in the meetings of R.A.F. pilots and machines.

A pooling scheme whereby all associated Clubs represented on the General Council at Jan. 1, 1928, share the profits of all of these meetings, was agreed.

The race for the Air League Challenge Cup will be held in the Eastern area, probably from Norwich, on Monday, Aug. 6, and is to be organised by the Norfolk and Norwich Aero Club.

An inter-Club competition will be held at each of the official race meetings, open to all aircraft belonging to associated Clubs and flown by pilots trained by those clubs. Marks will be awarded at each meeting (5 for a win, 3 for a second and 1 for a third), and the Club gaining the greatest total of marks will be awarded the Challenge Trophy and cash prize of £75 presented by the Society of British Aircraft Constructors.

The London Aeroplane Club.

[Sec. : H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Jan. 22.

Flying Time 2 hr. 20 min. Jan. 17 was the only day on which flying was possible and then for a short time for solo flying only. *Soloists.*—R. Sanders Clark, H. Solomon, W. Hay, A. F. Wallace, and C. Paul.

The London Club has experienced a very bad time for the last two months. The very short periods between the rain does not allow the Aerodrome to recover and it has been quite unfit for instructional work. It has, however, given the Staff the opportunity of overhauling the engines, and the four Moths are now ready for making up some of the lost time as soon as the weather conditions permit.

The Lancashire Aero Club.

[Sec. : Woodford Aerodrome, near Stockport.]

Report for week ending Jan. 21.

Flying Time 5 hr. 35 min. *Instruction* 1 hr. 55 min. *Soloists* 1 hr. 30 min. *Passenger* 1 hr. 45 min. *Tests* 25 min. *Instruction.—With Mr. Brown*—Messrs. Meads, Gort, Hall and Moss. *Soloists (under instruction).*—Mr. Browning. *Pilots.*—Mr. Twemlow, Miss Brown. *Passengers.—With Mr. Twemlow*—Messrs. Allott and Sullivan. *With Mr. Cantrill*—Mr. Brown. *With Mr. Lacayo*—Mr. Browning.

Notes.—There is nothing aeronautical to report, except that Mr. Browning successfully accomplished his height test.

Empire Flights.—Mr. Cantrill, who left Woodford on Dec. 31, with the object of flying to Blackpool, returned safely on Jan. 22, having reached Southport. He covered a total distance of nearly 100 miles at an average speed of a little under ¼ m.p.h.

The Newcastle-upon-Tyne Aero Club.

[Sec. : A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Jan. 22.

Flying Time 14 hr. 20 min. on Club aircraft (Q.V.L.X. not yet having returned from de Havillands). In addition to this, 1 hr. 30 min. w flown on Miss Leathart's Grasshopper, piloted by Mr. Parkinson wi Miss Leathart and some of her friends as passengers. *Instruction* 8 h 10 min. *Soloists* 1 hr. 30 min. *"A" Pilots* 4 hr. 30 min. *Tests* min. *Under Instruction.*—Miss Rambaut, Mr. L. Runciman, Mr. L. Middleton, Mr. N. Horn, Mr. V. Heaton, Mr. A. Sadler. *Soloists.* Mr. De Pledge. *"A" Pilots.*—Mrs. Heslop, Dr. Dixon, Mr. C. Thomson, Mr. D. Wilson, Mr. F. L. Turnbull. *Passengers.—With Mr Heslop*—Miss Leathart, Mr. C. Thompson. *With Mr. C. Thompson*-Mr. Luckman, Mrs. Heslop.

The Yorkshire Aeroplane Club.

[Sec. : Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Jan. 21.

Flying Time 9 hr. 15 min. *Instruction* 3 hr. 10 min. *Soloists* 4 h 25 min. *Passengers* 1 hr. 40 min. *Instruction.—With Mr. Beck* Messrs. Bamford, Ostler, Ellison, Birch, Shires, R. K. Lax. *Soloists.* Messrs. Dawson, Ellison, Birch, Lister, Critchley, M. B. Lax. *"A Pilots.*—I. Thomson, R. Atcherley, D. Atcherley, Wood. *Passengers. With Mr. Beck*—Mr. Greenwood. *With Mr. Lister*—Mr. Hepwort *With Mr. Wood*—Mr. Critchley.

Things are looking up; we have actually had two-and-a-half da during the past week when the weather permitted flying.

On Thursday Mr. Ellison completed his height test and all e aminations for his "A" Licence.

The Midland Aero Club.

[Sec. : Gilbert Dennison, Villa Road, Handsworth, Birmingham.]

Report for week ending Jan. 22.

Flying Time 5 hr. 35 min. *Dual Instruction.—With Mr. McDonough* Messrs. E. Lane, E. Wynn, C. Robson and N. Baker. *Soloists.*-Messrs. S. H. Smith, R. Jackson, H. Willis and E. R. King.

Owing to high winds and heavy rain, flying was again restrict this week.

The Norfolk and Norwich Aero Club.

[Sec. : H. O. Bennett, 5, Opie Street, Norwich.]

Report for week ending Jan. 22.

Flying Time 3 hr. 30 min. *Instruction.—With Mr. Lines*—M Surtees. *Soloists.*—Messrs. H. Pank, F. Gough, C. A. Rea. *Pa sengers.*—Messrs. G. Brett and H. Mack.

The Suffolk Aeroplane Club.

[Sec. : Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Jan. 22.

Flying Time 1 hr. 30 min. *Instruction.—With Mr. Lowdell*—Mr. Billington. *Passenger.—With Mr. Prentice*—Master Eugene Prentic *Soloists.*—Dr. Jas. Sleigh, Mr. S. Schofield.

Notes.—We have always been very proud of our President, The Ho Lady Bailey, and we are delighted that the well-deserved honour Champion Lady Aviator of the World should be conferred upon he

Lady Bailey flew over on Saturday in spite of the extremely ba weather and attended the Club's first Annual Meeting in the eve ing. At this meeting it was definitely decided to purchase a secor machine immediately.

Gales and fog have held up flying throughout the week.

The Bristol and Wessex Aeroplane Club.

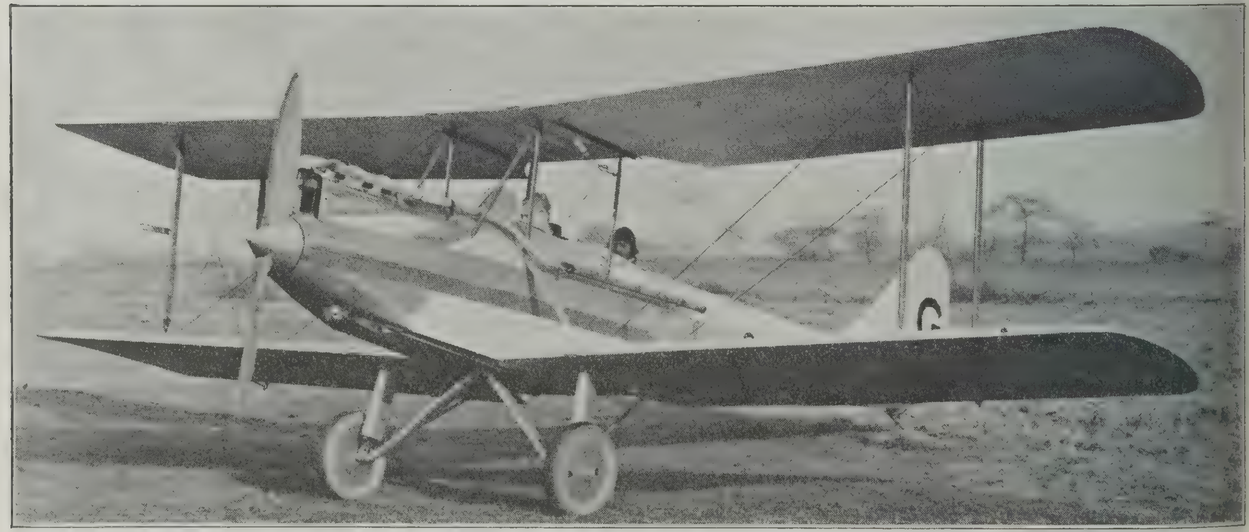
[Sec. : C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Jan. 21.

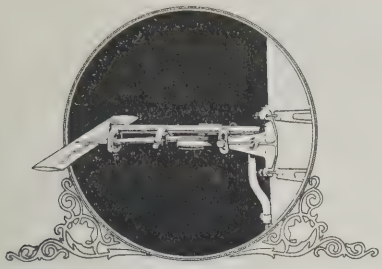
Flying Time 1 hr. 25 min. *Instruction* 1 hr. 25 min. *Instruction. With Mr. E. B. W. Bartlett*—Hon. H. C. H. Bathurst, Mr. D. Tanne

The total hours flown are the lowest recorded since the Club start flying. The weather has been very bad, and flying was only possib for half a day.

Owing to the increase of the clerical work of the Club, C Flemming has found it impossible to devote sufficient time to Cl matters and Capt. C. F. G. Crawford has taken on the duties Secretary.



THE HAMPSHIRE AEROPLANE CLUB'S LATEST ACQUISITION.—An Avro Avian (Cirrus Mk. II engine) which has just been delivered.



asily fitted to any machine

The simple mechanism of the Savage-Bramson anti-stall gear weighs only 8 lbs., and can be fitted without any structural alterations to the machine. Its simple signalling impulse cannot be disregarded, it is impossible for a pilot to stall a machine *inadvertently* if the machine is equipped with this device, which never denies the pilot full control.

The Savage-Bramson gear is the only means available to prevent inadvertent stalling and its natural consequences.

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LOOK FOR Pratts Ethyl Petrol THIS SIGN
KNOCKS OUT THAT "KNOCK"

D.A. 90.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 14; Tuesday, 17; Wednesday, 14; Thursday, 15; Friday, 2; Saturday, 1; Sunday, 3.

IMPERIAL AIRWAYS LTD.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 27, passengers 140, freight 8 tons.

AIR UNION:
Paris—London: Machines 14, passengers 37, freight 11 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 10, passengers 34, freight 1½ tons.

SABENA:
Brussels—London: Machines 7, passengers 1.

DEUTSCHE LUFTHANSA AG.:
Amsterdam—London: Machines 8, passengers 12.

PRIVATE:
Machines 0, passengers 0.

Total number of trips by British Machines, 27, carrying 140 passengers. Foreign Machines, 39, carrying 104 passengers.

COMPARATIVE FIGURES.

Week ending Jan. 22:
Machines, 66; Passengers, 244; Crews, 119; Total personnel, 363.
Corresponding week, 1927:
Machines, 46; Passengers, 122; Crews, 76; Total personnel, 198.
Corresponding week, 1926:
Machines, 53; Passengers, 112; Crews, 61; Total personnel, 173.
Corresponding week, 1925:
Machines, 41; Passengers, 60; Crews, 54; Total personnel, 114.
Corresponding week, 1924:
Machines, 40; Passengers, 62; Crews, 62; Total personnel, 124.
Corresponding week, 1923:
Machines, 63; Passengers, 131; Crews, 123; Total personnel 254.
Corresponding week, 1922:
Machines, 13; Passengers, 30; Crews, 20; Total personnel, 50.
Corresponding week, 1921:
Machines, 15; Passengers, 5; Crews, 17; Total personnel, 22.

Croydon Notes.

Mr. Wheeler, who during the last few months has proved himself to be one of the most able and reliable of Imperial Airways pilots, is leaving this country to join the Middle East service. Mr. Wheeler will undoubtedly be a loss to the European services, but will undoubtedly prove an acquisition on the Cairo-Basrah service.

K.L.M., who have regularly been using Jupiter IV engines built by the Gnome-Rhone firm in France, and who have found them very satisfactory, have recently started using Jupiter VIs of the same make, but with somewhat less satisfaction. It seems in this case that the high standard achieved by the Bristol Co. in the manufacture of these engines is not quite equalled abroad.

The curious feature of this trouble with the French-built Jupiters is that defects are most likely to occur with brand-new engines in their first few hours of flying.

Rumours that Imperial Airways have ordered a batch of new machines for delivery this summer, though persistent, are unfounded. Imperial Airways are looking for certain new aircraft, but so far nothing more than the making of inquiries has occurred.

Some few weeks ago it was mentioned in this paper that the Sabena firm were now running some very old Fokker FII machines, now about seven years old. Two of these machines at least have been running regularly for the past month or two. Originally they belonged to K.L.M. and after they had been removed from the regular service they were used for at least two years for joy riding, and then sold to the Sabena firm.

They have still the original three-ply covering on their wings, and the original K.L.M. paint on their bodies, and they do not appear to be likely to need any serious renovation for another few years. This is a fairly good testimonial to Fokker design and workmanship.

AERODROME OBSTRUCTIONS.

Air Ministry Notice to Airmen No. 3 of 1928, dated Jan. 21, conveys the following warnings to pilots of aircraft:—

Bicester.—Owing to the soft state of the ground, landing should only be effected W. of the landing circle, but not within an area of 200 yards from, and parallel to, the W. boundary.

Littlestone.—The aerodrome is waterlogged and unfit for use.

Northolt.—The aerodrome is now fit for use, except for an area W. of a line running N. and S., 200 yards from the W. boundary.

North Weald.—The aerodrome is waterlogged, and should only be used in an emergency.

Penshurst.—The aerodrome is now fit for use but great care is necessary as there is a quantity of surface water on the E. portion.

The Farnborough, Marden and Manston aerodromes which have been notified in Notices to Airmen as being either unfit for use, or having obstructions, are now available for normal use.

Bicester, Donibristle and Hendon.—Landing circles are in course of construction at these aerodromes. The obstructions will be marked by red flags by day but will be unmarked at night.

Duxford.—Top dressing of the aerodrome is being carried out Obstructions will be marked by red flags.

MR. VAN LEAR BLACK'S 1928 PROGRAMME.

Mr. Van Lear Black, who last year flew a total of nearly 44,000 miles, including a trip to Batavia and back, on a Fokker F.VII chartered from the K.L.M., has arranged for further extensive flying during the coming year.

The same Fokker F.VII as he used last year is now at Croydon and will be used by him for ordinary touring in Europe.

In the meantime the K.L.M. firm are making arrangements for a tour from London to Cape Town and back, which Mr. Black wishes to make during the coming spring. This however is not to be made on the F.VII but on a three-engined machine. Full details of the particular machine have not yet been settled.

The intention is to make the trip in only ten stages, of an average length of 600 miles or so each. It is also settled that the same pilots, Messrs. Geyssendorfer and Scholte, and the same mechanic, Mr. Weber, who accompanied Mr. Black to Batavia, will go on this trip.

A FRENCH ACCIDENT IN GERMANY.

On Friday, Jan. 20, one of the machines of the Farman Line on the Paris—Berlin service crashed at Tecklenburg (near Osnabruck), in an attempt to make a forced landing i a thick fog.

Two German passengers were severely injured, and the pilot, Mr. Noelhar, died in hospital on the evening of the same day.

One French passenger, who jumped at the last moment escaped with minor injuries.

THE RACE FOR THE KING'S CUP.

The Royal Aero Club announces that, at a meeting of the Racing Committee held on Jan. 18, it was decided, subject t His Majesty the King's approval, to hold the Race for the King's Cup in the month of July.

The race will occupy two days and will be over a circuit o approximately 1,000 miles.

The circuit will include the Aerodromes of practically al the Light Aeroplane Clubs, where the Competitors will make compulsory stops for re-fuelling.

THE ROYAL AERO CLUB.

The Royal Aero Club announces that Mr. J. D. Siddeley has presented to the Royal Aero Club a Challenge Trophy and prizes of £250 for a competition amongst the Light Aeroplane Clubs. For the year 1928, Mr. Siddeley has agreed that the Competition should be included in the Race for the King's Cup. The Competition is open to aircraft, the weight empty not to exceed 1,000 lbs. Weight empty means the tota weight of the aircraft in flying order. The following weights are not included: Petrol, Oil and Crew. The weight of wate in the radiators shall count in the weight empty. The aircraft must be owned by a Club or Member of a Club. The Pilots must be Members of the Club entering, and in the case of privately-owned aircraft, the owner must be the pilot Paid Pilot Instructors are excluded.

THE ROYAL AERONAUTICAL SOCIETY.

MEETINGS IN FEBRUARY.

Thursday, Feb. 2.—Flt. Lt. R. E. H. Allen, "Ground Transport fo an Air Organisation." 6.30 p.m.

Tuesday, Feb. 7.—Wing Cdr. J. G. V. Fowler, A.F.C., "The Maintenance and Repair of Aero-Engines." Joint meeting with the Inst Automobile Engineers at 7.45 p.m.

Thursday, Feb. 16.—Mr. G. P. Douglas, M.C., D.Sc., "Experiment on Model Airscrews at High Tip Speeds." 6.30 p.m.

All these meetings will be held at the Royal Society of Arts, 1 John Street, Adelphi, W.C.2. The paper originally arranged fo

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F). 2, on "The Design and Construction of Steel Aircraft," has bn unavoidably postponed owing to the illness of the author, Major HN. Wylie.

THE AUTHORS' CLUB.

:olonel the Master of Sempill was the guest of honour at t fortnightly dinner of the Authors' Club on Jan. 16. The s)ject of discussion was "The Future of Aviation." The cir was taken by Dr. A. P. Thurston (formerly R.A.F.), a l the vice-chair was taken by Wing-Cdr. H. M. S. Turner, B.E., R.A.F. Medical Branch.

eplying to the toast of the club's guest, Colonel the ster of Sempill described the development of civil aviation i this country, and said that 25,000 miles of main arterial a routes and 60,000 miles of feeder air routes were needed. British air routes 3,000 miles was being flown per day, a'l on German air routes 35,000 miles was being flown per d. He thought the case of the airship was sufficiently song to warrant a trial. There was a strong case, from t British point of view, for the flying-boat, but greater rability and economy of running was required. The only tly commercial form of air venture at the moment was air s vey.

)pening the discussion, Mr. T. O. M. Sopwith said that ive trebled the rate of progress in 14 years and continued a that rate for another 14 years we should be able to fly rnd the world at the rate of 1,000 miles an hour in 24 hrs by standing still while the earth turned under us.

ord Thomson said that he had always been drawn to the ihter-than-air vessels. He thought that their effect on the tish Empire would be so vast that it was well worth a cntry like ours, however broke we might be, to spend a ge amount of money on experiments.

QUANTAS SPIRIT.

:he activities of the Queensland and Northern Territory rial Services Ltd. of Longreach have now grown to a nthly average of over 10,000 miles. Since its inception t Service has flown 490,000 miles in all conditions and in a weathers.

or the last five years the Company has used ordinary g de Shell Motor Spirit in its aeroplanes. Bulk outfits have bn installed by the Shell Company for the Q.A.N.T. Aerial Svices Ltd. at Brisbane, Charleville, Longreach, and Cloncry, and a special pump at Camooweal. Q.A.NT. Aerial Svices Ltd. is using 1,500 gallons of Shell Motor Spirit ery month.

SATISFACTION.

British Anzani Engineering Co. Ltd.—Satisfaction in full on Dec. 20, of Memorandum of Deposit dated July 13, 1927, securing certain guarantees given by E. Burt on behalf of the company for the payment of certain rents and the performance of certain covenants as therein mentioned.

EXCHANGE WANTED.

Flying Officer posted to India wishes to exchange with officer posted to 'Iraq, Egypt, Aden, etc. Write "B," c/o The Aeroplane, 175, Piccadilly, W.1.

PERSONAL NOTICES.

Death.

DAUNCEY.—On Jan. 23, at Martlesham, Suffolk, as the result of a flying accident, Harold Campbell Gambier Dauncey, Flg. Off., R.A.F.

Mr. Dauncey entered the R.A.F. in September, 1925, with a S.S. comm. and was posted to the Central Flying School for a course of flying instruction. In September, 1926, he was posted to No. 23 (Fighter) Sqdn., and in October, 1927, he was posted to No. 22 (Bombing) Sqdn., which is included in the establishment of the Aeroplane and Armament Experimental Establishment at Martlesham Heath.

STEVINSON.—On Jan. 17, at Tidworth, as the result of a flying accident, Guy Stevinson, Plt. Off., R.A.F.

Mr. Stevinson passed out of the R.A.F. Cadet College, Cranwell, in July, 1926, and was posted to No. 58 (Bombing) Squadron. In August, 1927, he was posted to No. 17 (Fighter) Squadron. He was educated at Victoria College, Jersey. At Cranwell he played Cricket and Hockey for the Cadet College.

Marriage.

PLEVINS—BYRNE.—On Jan. 18, at St. Paul's, Knightsbridge, Mr. St. John Plevins, late Grenadier Guards, elder son of Mr. and Mrs. Plevins, of 24, Lennox Gardens, to Miss Virginia Byrne, daughter of Col. Frederick Byrne, C.M.G., and Mrs. Byrne, of 54, Sloane Street, London.

Forthcoming Marriage.

GROVES—HUMPHERY.—The engagement is announced of Flt. Lt. J. Osborn Groves, eldest son of Col. and Mrs. Groves, of Dan's Green Hall, Lymm, Cheshire, and Miss Elizabeth Mary Humphery, younger daughter of the late Mr. and Mrs. H. C. Humphery, of Beaulieu, Hants.

Birth.

TAYLOR.—On Dec. 10, 1927, at Sourabaya, Java, to Henriette (*née* van Barthold Muller), wife of Ronald B. L. Taylor, late South Lancs Regt. and R.A.F.—a son.

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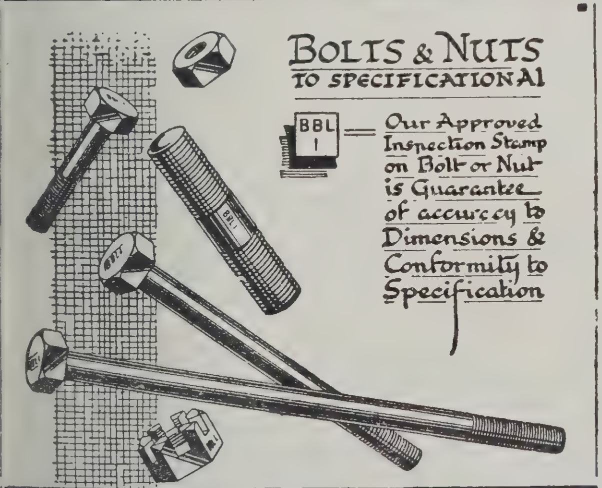
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FOREIGN TRADE—II.

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INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

Vol. XXXIV. No. 5. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"HASTE, FOR THEY TALK OF EMPIRE THERE."
(Kipling.)

THE FIRST MOTH IN RHODESIA :—The arrival in Bulawayo of the first D.H. Moth purchased by the Rhodesian Aviation Syndicate. On Jan. 9 it left Bulawayo, piloted by Capt. Douglas Mail, A.F.C., with Mr. A. G. Hay, a director of the Syndicate as passenger, on a demonstration tour round Rhodesia.

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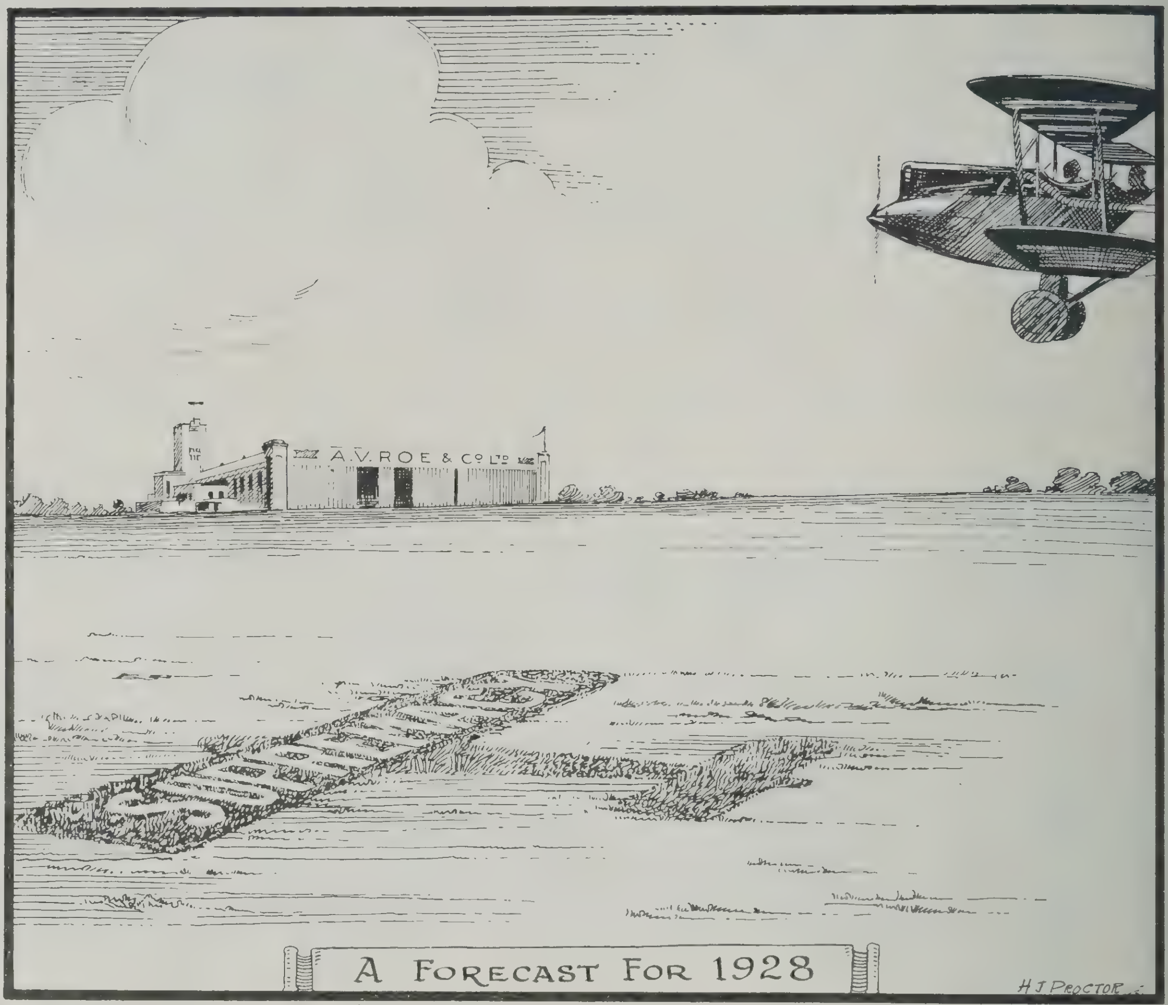

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THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV.
No. 5.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON GETTING AND KEEPING FOREIGN TRADE.—II.

HALF A CONCESSION.

Comparatively recently, as the result of a great deal of gument by intelligent officers at the Air Ministry, permission has been given for people in the Aircraft Industry to fer for sale abroad machines of types which have been lopted as standard by the Royal Air Force, but have been ttered by newer experimental types. Which means that e Aircraft Industry is allowed to sell abroad war-machines nich are merely obsolescent and not actually obsolete.

But the Aircraft Industry is not allowed to sell abroad new d improved types of war machines which it may produce its own expense. If it were allowed to do so, foreign tions might very easily be equipped with British machines tter than those used in the Royal Air Force.

This prohibition comes under a law by which the Government can prohibit the export of war material of any kind. ad, obviously, at bottom, such a law is thoroughly sound. therwise we might have armament firms which had failed get big orders from our Government making a large forne out of nations which have an evident intention of going war with us when adequately equipped. For example, no ubt the Union of Soviet Republics would be willing to y many millions to our armament firms for guns, tanks and rcraft.

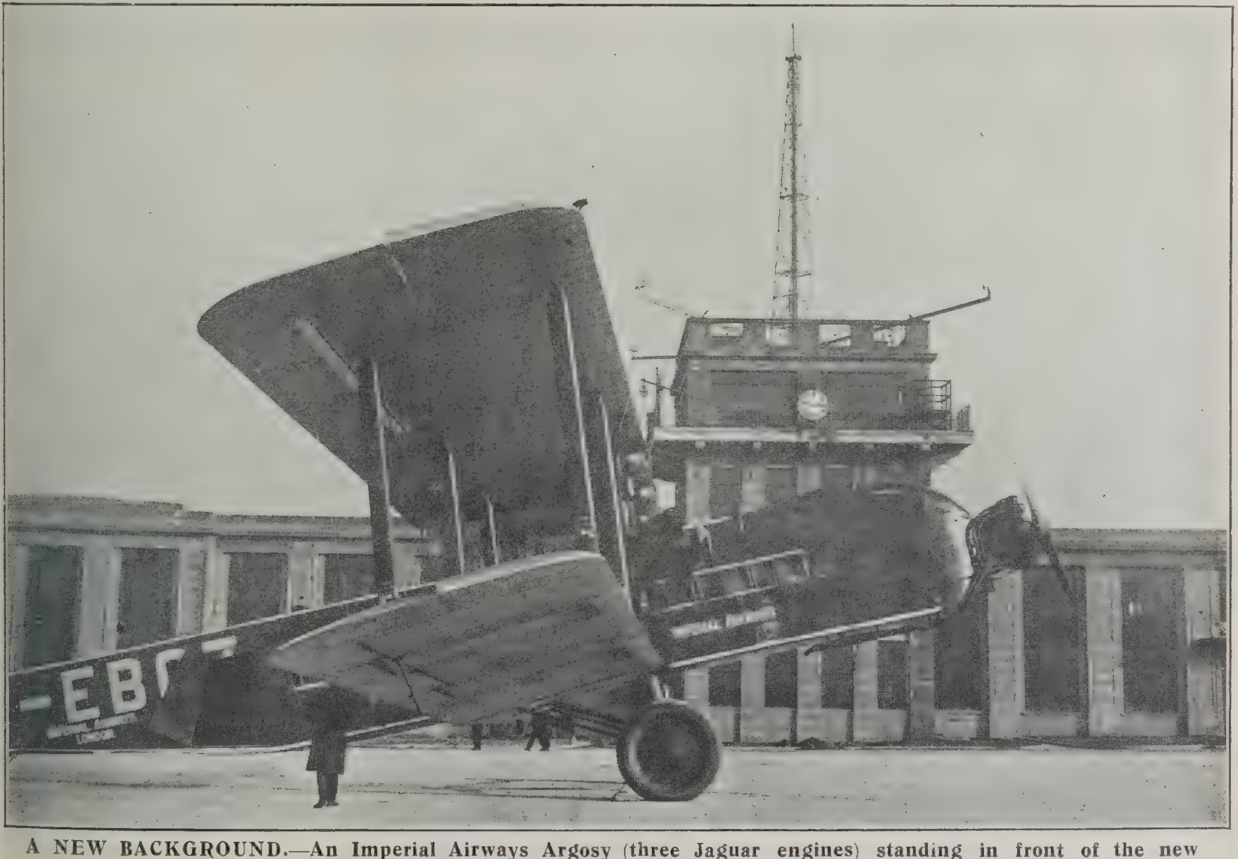
But the reason for prohibiting the export of the most odern aircraft in small quantities to nations—like the South nerican Republics—which cannot in any case go to war th us—is not in the least evident. In fact there is no really od reason why such nations, if they so wish, should not be allowed to buy duplicates of experimental machines which are still under test at Martlesham or Felixstowe.

The Latin-American Republics would not be in the least likely to try to build duplicate machines for themselves, and if they were so impressed by our new experimental machines as to order them in something like quantities, whatever they ordered would fit in along with the output of similar machines ordered for the Royal Air Force and so would reduce the total cost of production, thus not only bringing money to this country but giving the aircraft manufacturers a better profit on their output.

CLOSER CO-OPERATION.

Incidentally, in this connection, although one would not suggest for a moment that the Royal Air Force should become a sort of sales depot for the Aircraft Industry, or that every Air Force officer should become a sort of commercial traveller for British aircraft, one cannot help suggesting that individual Air Force officers, especially commanders of Air Force Stations visited by foreign missions, and officials of the Air Ministry who are told off as escorts to such missions, might do a little more than they do to push the merits of British aircraft. Also there might be a good deal closer understanding between the Air Ministry and the Aircraft Industry in such matters.

R.A.F. officers will do well to remember that the more they do to help the sales of British aircraft, the better will British aircraft constructors be able to afford to experiment and produce better machines for the R.A.F. So any help they give to the Trade is really helping themselves.



A NEW BACKGROUND.—An Imperial Airways Argosy (three Jaguar engines) standing in front of the new control tower at the London Air Port, Croydon.

One has heard during the last year or two of quite a number of foreign missions which have visited this country and have been taken to various R.A.F. stations where demonstrations of flying have been given for their benefit, and where they have been shown our machines (mostly obsolete) and our methods of storing and maintenance and handling (which are the best in the World). But, so far as one has been able to gather, absolutely no attempt has been made on the part of the Air Force to use these visits for the benefit of the Aircraft Industry.

In some cases, the foreign missions have actually come to this country, have been taken round our Air Stations and have gone away again without some of the firms in the Aircraft Industry ever knowing they had been there. Of course, a good deal of the blame for their ignorance must lie on the firms themselves for not keeping properly in touch with the various foreign legations and embassies. Also, one imagines that it would naturally be part of the duty of the Society of British Aircraft Constructors to inform all its members of the arrival of every foreign mission, and to discover and distribute to its members as much information as possible about every individual who is part of such mission. But the fact remains that the necessary lines of communication do not exist, or if they exist, they do not work.

In yet another way there is a serious gap to be filled. The British Industry is not informed about important technical developments abroad, which are reported by our Air Attachés. We are singularly well represented in foreign countries, and, knowing what the foreign attachés in this country know of our affairs, one cannot believe that our attachés know less of developments in the countries to which they are accredited. So one is certain that the information which they send to the Air Ministry is bottled up by the civilian technical officials in Kingsway, either for their own aggrandisement, or through sheer stupidity, and is never passed on to the Trade, as it should be, for the good of the Nation.

In fact, there seems to be a very distinct need for a closer alliance all round between individual firms, the Society of British Aircraft Constructors and the Air Ministry. But such an alliance would, of course, mean co-operation. And co-operation has never been the strong point of the Anglo-Saxon peoples. The result is that the enterprising firms which maintain a well-run London office complete with its own liaison officer, both for the Air Ministry and the foreign embassies, legations and commissions, score over the others.

SOUTH AMERICAN POSSIBILITIES.

So far as war machines are concerned, undoubtedly our best prospective market is South America. There we have done quite reasonably good business, considering that immediately after the Armistice in 1918 the French and Italians started giving away war machines in quantities.

Thanks very largely to the energy of Mr. Gerald De
who has devoted hmself entirely during the past few y
to South America, and to the initial work of Major F
Scott who trained the Chilean Army Flying Corps, we h
done good business in Chile, despite the fact that
Americans sent some of their best pilots there to de
strate their very latest types of fighting machines. We h
at any rate, been able to sell Vickers-built Wibaults
Bristol Jupiter engines, and we have sold Fairey III

But one has noticed recently that the Americans have
a new mission to Chile equipped with the latest type Cu
Hawk. If we are to meet competition of that kind
Government must obviously relax still further the rule a
supplying the most modern machines, or must leave
firms free to offer machines of their own designs other
those bought by the Royal Air Force.

Also the late Major J. L. Travers did good with
Peruvian Navy. Brig.-Gen. Guy Livingstone, M
Kingsley and Capt. Holland have been working hard
Argentina. And of late Brig.-Gen. Francis Festing has b
exercising his well-known diplomatic talent in Brazil, wh
according to a dispatch just received, he has arranged
alliance between the biggest shipbuilding firm in So
America and the Blackburn Co., by which Blackburn airc
will in future be built at Rio de Janeiro. So we have
solid ground work in South America.

We must remember that, though we can never com
with the French on the actual price of machines, the re
intelligent South Americans such as the Chileans
Argentines and Brazilians are quite willing to pay us pr
well twice the price that they will pay any Contine
nation, simply because they know our aeroplanes are
much better built and so much more trustworthy, eve
our performance is no better. But now that our most mod
machines can beat Continental machines on performance
well, naturally foreign buyers expect better performance.

As Mr. Deane remarked to one when discussing
subject recently, it is absolutely useless in these days try
to push obsolescent aircraft in foreign countries, or
craft which are no better than those which can be supp
by competing nations at half the price. Much help w
be given to the British Aircraft Industry if we were allo
to submit to South American Governments, through
proper official channels, at any rate skeleton particu
of all our machines as and when they appear on the
Publication List.

By the time they have reached that stage they are eit
already being put into production in this country or
we have decided not to use those types. In either cas
foreign country might be disposed to buy a certain num
of such machines as experimental types from time to ti
And by the time that such types had actually been delive

IN A HURRY.—A Hawker Horsley two-seat long-distance day bomber (650 h.p. Rolls-Royce Condor engine). This type forms the equipment of Nos. 15 and 100 (Bombing) Squadrons.—("*Aeroplane*" *photograph.*)

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to South America those types would certainly be perfectly well-known to all the Naval and Military Air Attachés in this country of such Continental Powers as would be at all likely to put up similar machines in opposition to them.

Air Ministry Efforts.

So far as the Air Ministry is concerned, to give it its due, it has done all it could for the prestige of British aircraft. It supported the British exhibits at the Gothenburg Exhibition in 1923 by sending some flying-boats to the Baltic. It arranged another Baltic cruise in 1927 which has had excellent effect. It has undertaken that magnificent flight to Singapore with the Supermarine Southampton flying-boats, Napier engines, which so far has progressed so satisfactorily. Purely as a Service exercise it has arranged regular annual flights from Cairo to the Cape and back, and to Kano and back, flights which have impressed all other nations with the reliability of our aircraft. Wherever it has not been checked by the Treasury the Air Ministry has backed the Trade magnificently.

Showing the Flag.

A suggestion has now been made that the Air Ministry should subsidise, if it cannot itself organise, a flying-boat cruise round South America. This, one feels, would be an excellent idea. The British Fleet has habitually in the past visited the South American ports. But South America has seen nothing of British Service aircraft. On the other hand, South America has been immensely impressed by the successful cruise all round its coasts of a squadron of Loening amphibians belonging to the U.S. Air Corps.

Surely, after the success of the Far East flight, a flight round South America could be done by the Royal Air Force, using one of our own West Indian Islands as the starting and stopping place, and as our excuse for having Service machines in that part of the World,—despite the Monroe Doctrine.

Failing that, possibly a trip round South America might be done by a Short Calcutta, seeing that it is the only flying-boat of its size which has been produced as a commercial as well as a Naval type. With its 1,500 mile rang its high cruising speed, its seaworthiness, and the fact tha its three engines make it pretty safe to take it over lon stretches of land, it seems to be particularly suitable for th job. Such a boat might even be adequate for a tran Atlantic journey under its own power, given a little he by shipping just to give it a chance of rescue if it shou happen to come down in mid-ocean.

There are certain difficulties in the way. One gathers th the Calcuttas which are being built are intended for Imper Airways who want them as soon as they are commission Secondly, the manufacturers themselves could not very w stand the whole expense of the trip. And thirdly, if Government were prepared to stand the expense, other a craft manufacturers might ask why that particular firm w so favoured.

At the same time, if those three objections can be ove come, the trip would be well worth doing. But if it is goi to be done it ought to be done this year, and not ne year when the American invasion of South America has beg to take effect.

There is a fourth possibility, namely that all the fir whose materials have been used in the Calcutta,—the eng makers, the suppliers of metals, the suppliers of tim the suppliers of instruments, the suppliers of airscre wireless and so forth, might all club together to finan the scheme, very much as Sir Alan Cobham's trips ha been financed by interested parties, in addition to t munificence of Sir Charles Wakefield. One offers t suggestion for what it is worth.

At any rate such a trip would be worth a great deal mo to the prestige of British aircraft than would any sing hit-or-miss flight across the Atlantic,—and it seems possi to collect finance for these crazy Atlantic affairs.

Anyhow, hereinbefore are a few suggestions to the Briti Aircraft Industry and to the Air Ministry as to how we m avoid losing money at present and as to how we may the foundations for making money when our Trade Boo comes along.—C. G. G.

EARL HAIG OF BEMERSYDE.

By the death of Field-Marshal Earl Haig of Bemersyde on Jan. 29 Service Aviation has lost one of the best friends it has ever had, and the British Nation has lost a great soldier.

When in December 1915 General Sir Douglas Haig assumed, with no great pleasure, the Command-in-Chief of the British Armies in France the Royal Flying Corps was in a bad way. The squadrons were poorly equipped, and were suffering from what was known as "the Fokker Scourge." The Army at large was not yet aware of the full value of aircraft, and co-operation between the troops on the ground and the new arm was not at its best. Major-General Hugh Trenchard had but recently taken command of the R.F.C. in the field, and had still all his work to do.

The task of building up the R.F.C. received the whole-hearted support of General Haig. Whatever he could do, whether by co-operation in the field or by bringing influence to bear at home, to strengthen the R.F.C. was done with that thoroughness for which Sir Douglas Haig was famous. The intercourse between G.H.Q. and R.F.C. H.Q. was of the closest, particularly so when the former was established at Montreuil and the latter at Hesdin.

There was a legend at Hesdin that when General Trenchard, having pulled the R.F.C. together, found a crying need for trained staff officers, he appealed to General Haig for help. Promptly there arrived from G.H.Q. an officer of distinction, with a note which read, "Here is my best Staff Officer. Do what you like with him." Whether the story is verbally true or not, the officer of whom it is told was sent by Sir Douglas Haig, and is to-day still recognised as one of the most valuable in the R.A.F. And the facts illustrate the esteem in which the R.F.C. was then held by the Commander-in-Chief-in-the-Field.

Thenceforward, while General Trenchard commanded the R.F.C., and later when Major-General John Salmond took over the command at the beginning of 1918—and commanded the new R.A.F. till the Armistice—Sir Douglas Haig maintained the closest touch with the Air Arm.

One has vivid memories of the last fortnight before the Armistice, when G.H.Q. was in what was known as "Haig's Train" on the railway, near Velu Wood, and R.A.F. Advanced H.Q. were living in German huts close by, in the middle of the devastated area. There was constant coming and going of senior officers between the two, and the feeling at R.A.F. H.Q. showed one the high esteem in which all held Sir Douglas Haig as a soldier and as a man.

Earl Haig was only 67 years of age, and there seemed every prospect of his living for many years to enjoy the peace and happiness which he had done so much to win this nation, or even to serve his King once more in time need. He had, however, the satisfacion of seeing his cou try survive the perilous times which follow each great w and of knowing that the internal peace for which he h worked so well has at last come to us.—C. G. G.

The King's Tribute.

The Court Circular issued from Sandringham on Jan. contained the following notable tribute to Lord Haig from t King :—

The King has learned with profound sorrow of the dea of Field-Marshal Earl Haig, who will for all time be reme bered as the Commander-in-Chief of His Majesty's victori Armies in the Field.

The King knows that the sudden and irreparable loss this valuable life will be deeply felt throughout the wh Empire, by the Army, and more especially by Lord Hai old comrades, to whose welfare he had devoted himself si the close of the Great War.

The Tribute of the Services.

General Sir George Milne, Chief of the Imperial Gene Staff, sent the following telegram to Lady Haig on Jan. 3

> On behalf of the Army, the Army Council tender to you and y family their most profound sympathy in the irreparable loss you ha sustained by the death of your distinguished husband, who was lo and trusted by all the Armies of the British Empire which he led victory in the Great War.—Chief of the Imperial General Staff.

Marshal of the Royal Air Force Sir Hugh Trenchard, Ch of the Air Staff, sent the following telegram to Lady Haig

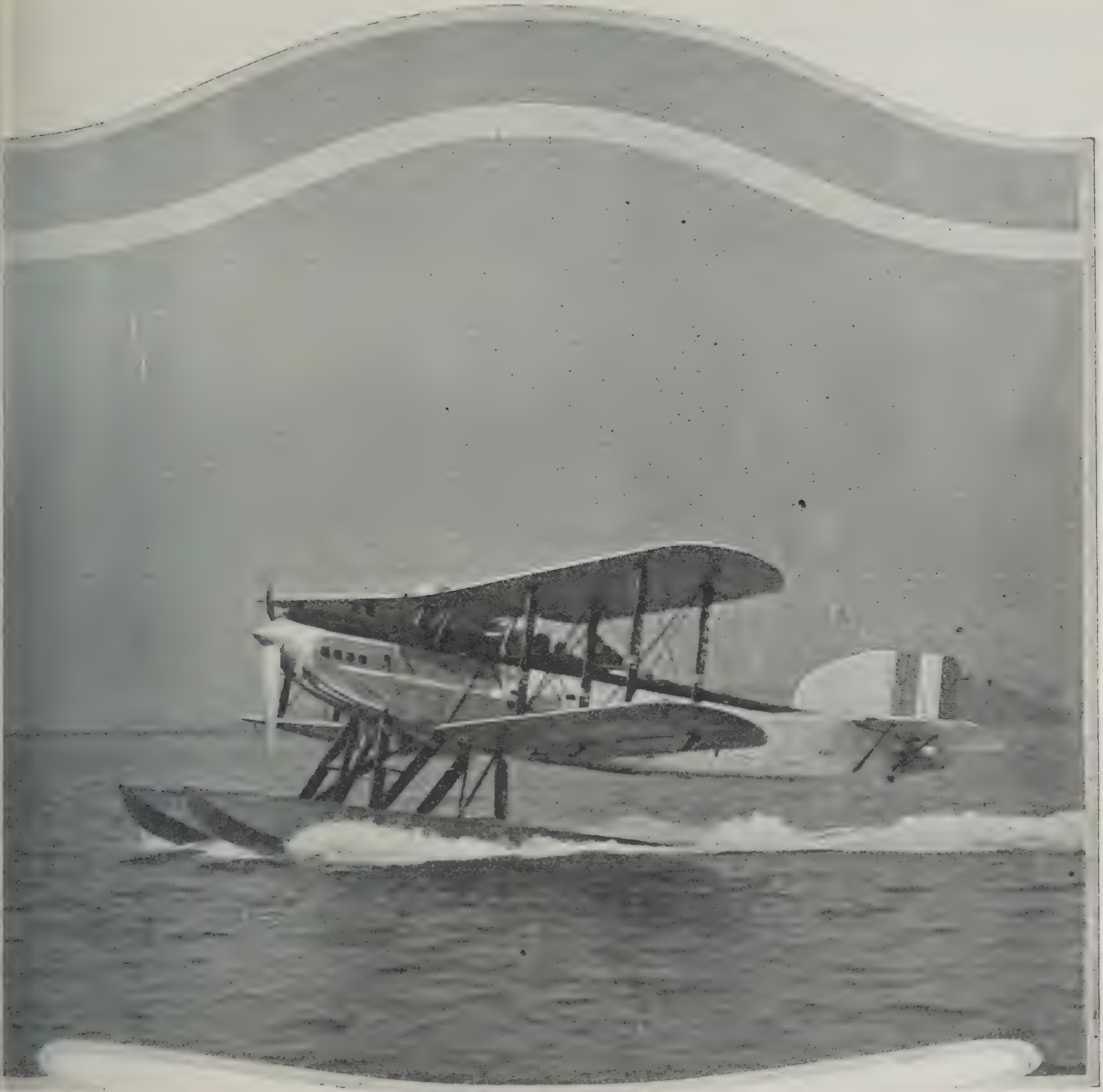
> All ranks of the Royal Air Force desire to express to you th heartfelt sympathy in your great loss, and to assure you that th will always cherish the memory of their Commander-in-Chief in Great War.

The Secretary of State for Air, Sir Samuel Hoare, also s a message of condolence on behalf of the Air Council.

THE BRITANNIA TROPHY.

The Committee of the Royal Aero Club will consider award of the Britannia Trophy for the year 1927 at its me ing in March next. The Britannia Trophy is awarded ea year "to the British Aviator who, in the opinion of Committee of the Royal Aero Club, shall have accomplis the most meritorious performance in the air during year."

The Royal Aero Club will be glad to receive particul of any meritorious performances for consideration by Committee when making the award. Particulars should addressed to the Secretary, Royal Aero Club, 3, Cliff Street, London, W.1, not later than Feb. 22, 1928.



The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier "Lion" engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

THE COMMAND OF THE U.S. AIR CORPS.

On Dec. 13, 1927, Major-General Mason Mathews Patrick, Chief of the U.S. Army Air Corps, retired at the age of 64.

General Patrick was, like so many distinguished officers in all armies, originally an Engineer Officer. His first important command was as Commandant of the Engineers' School at Washington, and in 1906-08 he was Chief Engineer of the Army of Cuban Pacification.

From May, 1918, to July, 1919, he was Chief of the Air Service in the American Expeditionary Force in France, where he commanded over 78,000 men. In 1921 he was appointed Chief of the U.S. Army Air Service at Washington, which post he held until it was transformed into the U.S. Air Corps as a distinct branch of the Army. He himself was largely responsible for the creation of the Air Corps and he very properly has been its chief up to the date of his retirement.

As an old regular soldier General Patrick had a difficult task in commanding the Army Air Service and later the Air Corps. Few of the Army aviators were regular soldiers except the senior officers. And even among the regular soldiers there was considerable disquiet owing to the fact that promotion in the Air Service, until the Air Corps was created, went by seniority in the Army and not by seniority in aviation. The result was that Army aviators with long and distinguished service held ranks far below that to which their experience and work entitled them.

General Patrick by a combination of tact and firmness did much to re-establish the spirit and moral of the Air Service and under him the Air Corps has become one of the most highly efficient of the Flying Services of the World. He takes with him into his retirement the good will and personal regard of all who have worked with him.

Major-General James E. Fechet succeeds General Patrick as Chief of the Air Corps. General Fechet was born at Fort Ringgold, Texas, in 1877, and so presumably is of regular Army stock. He enlisted in the Sixth Cavalry in 1898 and was given a commission in the Ninth Cavalry in August, 1900.

He began flying in October, 1917, and in 1918 had risen to be a Colonel commanding in turn various Flying Fields in the States. In 1919 he was Air Officer commanding the Southern District and in 1920 he was permanently transferred to the Air Service, when he became Chief of the War Plans Division. In 1925 he was appointed Assistant Chief of the Air Service with the rank of Brigadier-General.

The new Assistant Chief of the Air Corps is Brigadier-General Benjamin D. Foulois, who is one of the pioneers of American aviation. He was born at Washington, Conn., in 1879 and joined the Volunteer Engineers in 1898, enlisting in the Regular Army a year later and being given a commission in 1901. On the birth of Service aviation in the States Lieutenants Foulois, Lahm and Selfridge were detailed to operate the first Army dirigible balloon. Lieut. Foulois was in 1909 a passenger with Mr. Orville Wright on the first cross-country flight ever made by an aeroplane in the United States. Lieut. Selfridge was killed in an accident with Mr. Orville Wright shortly afterwards and was the first person to be killed in an aeroplane accident in America.

In 1910 Lieut. Foulois took the first aeroplane to the Army Base at San Antonio, Texas, and in 1910-11 he was the only U.S. Army officer on flying duty. In 1911 he designed the first aeroplane wireless set ever used in America and later in the year he broke the World's cross-country record for an aeroplane flight with a passenger. In 1913 he was employed in training the new U.S. Army Air Service. In 1914 he organised, equipped and trained the first U.S. Air Squadron, and in 1916 he commanded that Squadron in Mexico,—the first time aircraft had been used in war in America.

In 1917, when the United States came into the War, General Foulois was Technical Adviser in the preparation of the Aviation Bill which allocated about £150,000,000 to aviation. Thereafter he was Chairman of various joint Army and Navy Aircraft Committees in America and in Paris and after the Armistice he was the American member of the Inter-Allied Aviation Committee. During 1918-19 he was in charge of the Service of Supplies, and he was also a member of the Allied Commission which drafted the rules for International Air Navigation. Thus it may be seen that General Foulois has deserved well of the Commonwealth.—C. G. G.

THE HUDSON STRAITS EXPEDITION.

On July 15, 1927, an Expedition under Mr. N. B. McLean, an engineer of the Canadian Department of Marine and Fisheries, left Sydney, Nova Scotia, to investigate the period of navigation of the Hudson Straits with a view of opening up a Trans-Atlantic outlet for the products of Western Canada.

This Expedition was proposed by the Minister of Railways and Canals, under whose jurisdiction the Hudson Bay Railroad is being completed. The last leg of this railroad t Fort Churchill, on Hudson Bay, is due for completion i 1929, but before committing the country to an expenditure several millions it was decided to examine the practicabilit of opening up this terminal as a seaport.

Since the early '80s the navigability of the Hudson Strai has been in dispute. Investigation by Royal Commissio and Special Committees of Parliament have failed to remo doubts. Expert mariners have given conflicting evidenc It is known that the Straits never freeze over owing to th rapid current, but that each autumn ice drifts down fro Fox Basin through Fox Channel into the western end of th Straits and through the Straits to the Atlantic. Vast i fields drift into the Straits and have been known to ho up ships for months, but it has been considered possible th owing to the great width of the Straits, varying from 50 100 miles, there might exist a channel that is op throughout the year.

The Expedition consists of six flying officers, Flt. Lt T. A. Lawrence, B. G. Carr-Harris, F. S. Coghill, A. Leitch, A. J. Ashton, and A. A. Lewis, and sufficient no commissioned R.C.A.F. personnel to man three flying base A detachment of the Royal Canadian Corps of Signals f radio duties and a medical unit are included. The equi ment consists of six Fokker Universal monoplanes (200 h. Wright Whirlwind engines).

The Expedition arrived in the Straits in September an three bases were established—one at Nottingham Island, the westerly end of the Straits, one at Wakeham Bay, rough midway between Hudson Bay and Baffin Bay, and one Cape Burwell at the easterly outlet of the Straits.

Flying began on Oct. 15 and daily air patrols are bein made from each base in three directions, east, north an west, so that an area 100 miles wide and 1,200 miles lo is being covered every day.

The most favourable authorities had placed the closing da of the Straits for navigation not later than mid-Octobe Oct. 15 was fair and warm and no ice was in sight. N only were the Straits free of it, but none could be seen the southern reaches of Fox Channel. It was not until la November that a northern patrol reported sighting ice slow drifting southwards. This did not reach the Straits un the first week in December. On Dec. 10 aircraft report that a huge ice-pan blocked the Straits from end to end b that owing to raging storms it was not possible to say there was open water to the north of the pan but it w not considered likely.

Even in this short time through the agency of the a patrol the whole question of the navigability of the Strai had been placed in a new position. The air patrol h proved definitely that navigation in the Straits this year co tinued uninterrupted almost as long as on the Great Lak This in itself justifies the Expedition and will great strengthen the position of the Government in asking Parli ment for the necessary money to complete the Hudson B Railroad.

The Expedition will not complete its task until the spri of 1929 when the Government will decide if further patr are required.

AIR SURVEY AT THE BERLIN AERO SHO

At the Berlin Aero Show, which is to be held betwe Oct. 7 and Oct. 28 next year, a special section dealing wi aerial survey and photography, and the apparatus requir for such work, is to be arranged by the *Deutsche Gesellsch für Photogrammetrie.*

This exhibit is to range from aircraft designed and equipp for aerial survey through the whole of the specialised equ ment of such machines (cameras, instruments, etc.), app atus and equipment for mapping, and aerial photographs a maps produced therefrom.

It is desired to make this particular section of the exhi really international in its scope, and it is very much to hoped that the various bodies and firms concerned in ae survey work in this country will be able to arrange for representative exhibit of British aerial survey work.

The matter is properly speaking one for the Air Sur Committee to arrange. Aerial survey is one branch of av tion which we have made self-supporting in this country, a it would be a great pity if this section of British aeronauti enterprise is not represented at Berlin.

THE D.H. MOTH IN AUSTRALIA.

The Royal Australian Air Force has decided to replace t standard Avro 504 training biplane by the de Havilland Mo (32/80 h.p. Cirrus engine) and a series of twelve has be ordered from the de Havilland Aircraft Co. in this count

Further machines ordered later, will be built in Austra by the de Havilland Aircraft Proprietary, Ltd., of Melbour

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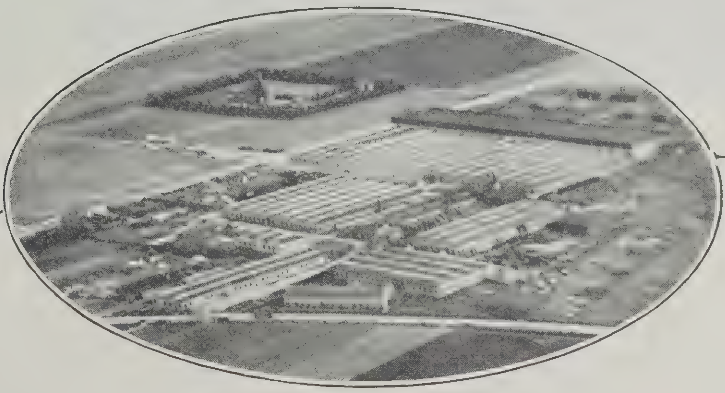
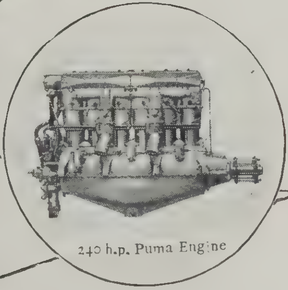


Aerial View of A.D.C.
Works at Croydon.

D.H.9 Puma Engine



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Avro type, 504K.

300 h.p. Hispano Suiza

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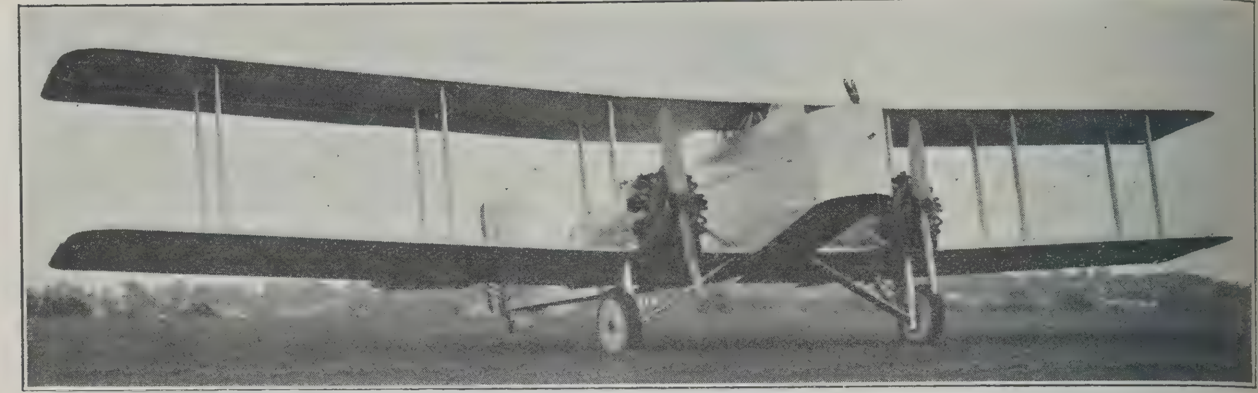


THE WESTLAND WESTBURY.—A three-seat fighter (two Bristol Jupiter VI engines) designed and built by the Westland Aircraft Works of Yeovil.

THE WESTLAND WESTBURY.

This machine, designed and built by the Westland Aircraft Works, of Yeovil, is classed by the Air Ministry as a three-seater fighter, and is, so far as memory serves, the first machine of this class the details of which have become available for publication.

So far as general arrangement and performance are concerned the Westbury resembles certain earlier twin-engined high-performance bombers, and in fact could readily be converted to serve in this capacity. Actually however it is fitted with two heavy calibre guns, and is presumably designed for the destruction of enemy aircraft.

The Westbury is a twin-engined biplane with equal wings, three rows of struts on each side and two Bristol Jupiter VI engines mounted on the lower wings in line with the inner pairs of interplane struts.

Two alternative types of wings have been built for this machine, one of normal timber structure and the other with duralumin spars and ribs.

The fuselage is of mixed construction. The front section or nose, carrying one gun-mounting, is built on a spruce framing covered with three-ply and is attached to the central section of the fuselage at four points. It is easily replaced in the event of damage.

The central body section to which the wing-structure is attached is framed in steel tube. Behind this the fuselage is built of spruce longerons and struts, and this after-section again is fixed to the central section at four points and may be removed and replaced if necessary.

The upper decking of the fuselage below and just aft of the wings is clipped to the fuselage structure and easily removable. If the rear heavy gun is not to be carried the whole of the normal upper decking can be removed and replaced in a few minutes by a new decking carrying the usual Lewis gun-mounting.

The pilot's seat is just ahead of the wings and the rear gun position just behind the wings. In the intervening space is a roomy compartment containing wireless equipment, a tip-up seat for the operator, and a passage giving communication between the front and rear cockpits.

Below the rear gun position a Lewis gun firing below the fuselage is mounted, and through the opening for this gun there is an entrance to the fuselage for the crew.

The undercarriage—of very wide track—consists of two Vees attached to the lower wing spars below the engine mounts, and a pair of axles hinged to the lower edge of the fuselage. The front leg of each Vee is telescopic and is fitted with an efficient shock-absorbing gear.

The tail unit is strut-braced entirely below the tail plane so that there are no wires liable to be shot away by the rear gunner. The tail plane is adjustable in the air.

The two Jupiter VI engines are carried on the lower wings on two steel-tube-framed structures. These are so arranged that the wings, complete with engines and mountings, can be packed onto standard railway trucks.

The Westbury, as can be seen from the appended specification, has an excellent performance. It is in addition very pleasant to fly and handles well with only one engine running. In this condition it will maintain straight level flight with normal load.

Specification.

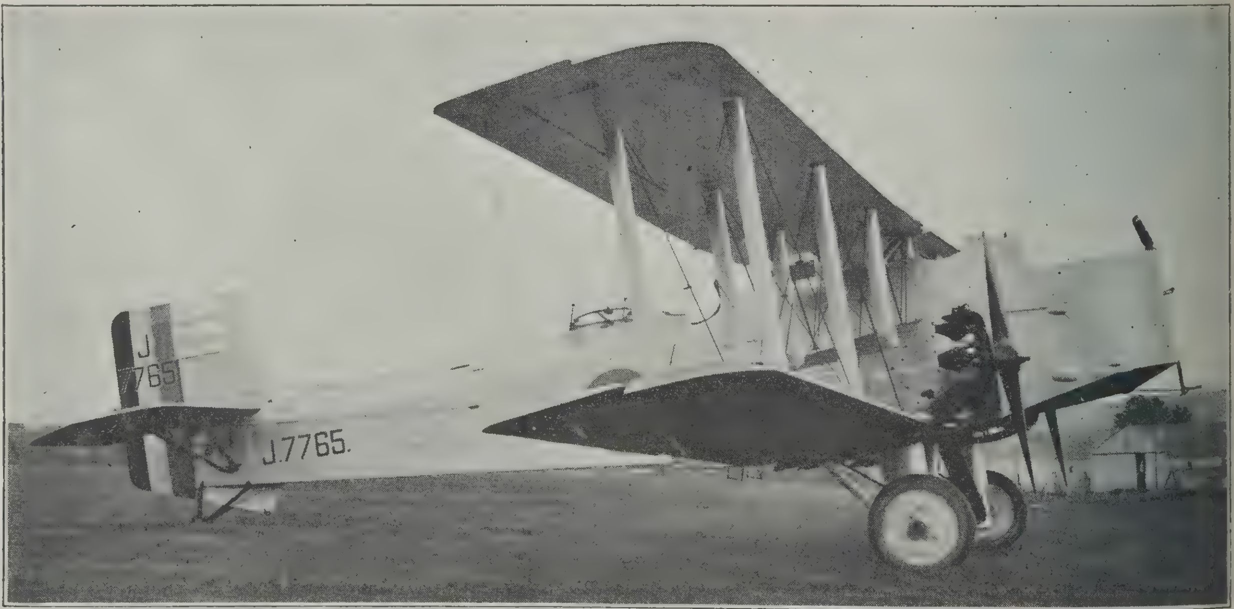
Dimensions.—Span 68 ft. 0 in. (20.6 m.), Length 43 ft. 4⅜ in. (13.2 m.), Height 13 ft. 9 in. (4.24 m.), Wing area 875 sq. ft. (82 sq. m.).

Weights and Loadings.—Weight empty 4,845 lbs. (2,200 kg.), Loaded 7,877 lbs. (3,580 kg.), Wing loading 9.0 lbs./sq. ft. (43.7 kg./sq. m.), Power loading (900 h.p.) 8.75 lbs./h.p. (3.98 kg./h.p.).

Performance.—Max. speed at 5,000 ft. (1,525 m.) 125 m.p.h. (201 km.h.), at 10,000 ft. (3,050 m.) 122 m.p.h. (196 km.h.), at 15,000 ft. (4,575 m.) 113 m.p.h. (182 km.h.), Climb to 5,000 ft. (1,525 m.) 4½ mins., to 10,000 ft. (3,050 m.) 10 mins., to 15,000 ft. (4,575 m.) 19 mins., Service ceiling 21,000 ft. (6,400 km.).

THE WRIGHT WHIRLWIND IN CANADA.

Towards the end of 1927 the Canadian Wright Co. Ltd. was incorporated in Montreal for the assembly of the Wright Whirlwind engine in Canada. Eventually complete engines will be manufactured by the new Canadian concern which has also acquired the manufacturing rights for Australia.



THE WESTLAND WESTBURY.—A side view of the three-seat twin-engined fighter which is designed to be equipped with two heavy calibre guns, one in the nose and one aft of the wings.

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Every day of the week at least one smart new MOTH leaves the de Havilland factory at Stag Lane Aerodrome and flies off to perform its task in the world. Whether it be landplane or seaplane for training, for taxi work, for photography, for exploration or for a private owner, who realises the joy and economy of travelling by light aeroplane, it is certain that each MOTH is the finest aeroplane in the world for the job.

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THE ANNUAL REPORT OF THE U.S. AIR CORPS.

The Annual Report of the Chief of Air Corps to the Secretary for War for the fiscal year ending June 30, 1927, was made public towards the end of 1927.

This annual report was the sixth and last to be submitted by Major-Gen. Mason M. Patrick before his retirement on Dec. 15, 1927.

The following *précis* of some of the more important passages of this report is considered to be of interest.

ORGANISATION AND PERSONNEL.

The only change in organisation within the Office of the Chief of Air Corps was the formation of an Inspection Division. This Division was organised primarily for the purpose of supervising the installation of the visual maintenance inspection system and to instal it uniformly at all Air Corps stations.

On June 30, 1927, the total commissioned strength of the Air Corps was 960, a gain of 41 over the number one June 30, 1926. Analysed into ranks, this represents a gain of 2 Brig.-Generals, 1 Lieut.-Col., 2 1st Lieuts, 38 2nd Lieuts., and a loss of 2 Majors.

In enlisted, or non-commissioned, pilots there was a loss of 14 thus making a total of 45 at the end of the fiscal year.

OPERATIONS.

Of Air Corps flights, the Pan-American flight by five Loening amphibians through Mexico, Central America, round South America and back to Washington by way of the West Indies, a total distance of 22,065 miles, and the flight by Lieuts. Maitland and Hegenberger, A.C., across the Pacific from Oakland, Calif., to Hawaii, on a Fokker three-engined monoplane, the longest over-water flight ever attempted, are the most noteworthy. The former flight was marred by the loss of two officers through a collision in the air between two of the machines at Buenos Aires.

From a tactical standpoint the outstanding operation of the Air Corps was its participation in manœuvres in conjunction with the 2nd Army Division at San Antonio, Texas.

All Air Corps units participating moved by air and arrived at San Antonio to schedule, and this concentration was in itself a practical exercise in rapid mobilisation. These manœuvres gave the first opportunity since the war for an Air Corps Staff and an Army Staff to conduct joint operations. The 1st Pursuit Group stationed at Selfridge Field, Mich., flew to Kelly Field, Texas, in one day, thus demonstrating the mobility of a pursuit unit to an unusual degree.

A flight of 13 Curtiss Hawk fighters of this same unit flew from Selfridge Field to Ottawa and Montreal and back in January, 1927, thus again demonstrating its mobility under extreme winter conditions. All machines were fitted with skis and made several landings on snow and ice under adverse weather conditions. The entire flight returned to Selfridge Field without damage to a single machine.

Machine-gun and bombing competitions were held at Langley Field, Va., the principal value of such matches being that all competing units are encouraged to practise with the result that their state of efficiency is greatly improved. Navy and Marine Corps units participated but the Army units finished first in all competitions.

During September and October, 1926, the Air Corps organisation at Phillips Field co-operated with the Coast Artillery and the Ordnance Department in anti-aircraft tests. 292 hours were flown by day and night and new target equipment was tested.

The Air Corps co-operated with those in charge of the flood relief over the inundated area in the Mississippi and Arkansas River valleys. In addition to carrying messages and serums and locating individuals in areas cut off by the flood waters the Air Corps undertook to make a photographic map of the flood zone at the request of the River Commission to help in the work of preventing similar floods in the future.

TRAINING.

On Aug. 25, 1926, the Secretary of War approved the establishment of the Air Corps Training Centre, with headquarters at San Antonio, Texas, to be composed of the Air Corps Primary Flying School, the Air Corps Advanced Flying School, the School of Aviation Medicine, and such other schools as may be ultimately established.

Brig-Gen. F. P. Lahm, one of the two Brig-Generals authorised during the year, was placed in command of this Centre. Towards the close of the fiscal year the Training Centre established a Flying Instructors' School.

In order to provide a complement of personnel to carry out the 5-year Programme it became necessary to establish a second Primary Flying School at March Field, Riverside, Cal. A revised system of training was decided upon and approved by the War Department on Apr. 5, 1927.

This system calls for (i) elementary flying schools to be operated at Brooks Field, Texas, and March Field, Cal., with courses of instruction of eight months' duration—these courses to include not only primary flying training but transition flying training in observation type of aircraft. (ii) a specialised flying school to be operated at Kelly Field, Texas, with a course of flying for a period of four months' duration for the training of graduates of the elementary schools as observation, bombardment, attack or pursuit pilots or as observers.

The training of the Air Corps Reserves was limited by lack of funds. On Sept. 1, 1927, all Curtiss JN aircraft were withdrawn from service.

National Guard training progressed satisfactorily, and the amount of flying showed an increase over that of the previous year. On Sept. 1, 104 Curtiss JN aircraft were withdrawn from service and new service types are gradually being allotted to all units. By 1929 all the 18 National Guard units will be equipped with 3 observation and 5 advanced training aircraft of modern type.

MATERIEL.

On Oct. 15, 1926, the Materiel Division was established at Dayton, Ohio, under the supervision of Brig.-Gen. W. E. Gilmore. Under this division were consolidated the functions previously performed by the Engineering Division, the Supply and Industrial War Plans Division and the Materiel Disposal Section leaving only the Materiel-Liaison Section in the Office of the Chief of the Air Corps.

McCook Field which had long been considered inadequate for the Engineering Division alone now proved to be out of the question for the housing of the new Materiel Division. A new site has been secured in the vicinity of Dayton and is being equipped for the accommodation of the Materiel Division. This site, named Wright Field, when completed, will house the Headquarters and Administrative Section, Experimental Engineering Plant and Flying Field, Procurement Division, Field Service Section, Repair and Maintenance Section, and the Industrial War Plans Section.

EXPERIMENTAL ENGINEERING.

Military aircraft have become definitely stabilised into six principal types, i.e., Pursuit, Observation, Attack, Bombardment, Training, and Cargo. During the fiscal year four suitable service types, namely, Pursuit, Observation, Training and Cargo have been produced, and a large amount of experimental work has been done in the Bombardment class. One noticeable trend of development has been the addition of wheel-brakes to all types of aircraft, except primary training.

Two standard pursuit types are in service—the Curtiss P-1 (Hawk) and the Boeing Pw-9. Air-cooled pursuit development was limited to the study of the Curtiss XP-3 with the Curtiss R-1454 engine. This engine proving unsatisfactory pending further modification the Pratt and Whitney Wasp was substituted, and this still awaits test. Experiments with the Curtiss P-5 with a supercharged Curtiss D-12 engine proved sufficiently satisfactory to justify the ordering of five machines of this type for service test.

The DH-4 observation aircraft with wooden fuselage is no longer given major overhaul, and is slowly going out of service. Of the new standard observation types the Douglas O-2 has been subject of considerable modification. It was found that when fully loaded control was lost after a long spin. After exhaustive tests this was overcome by moving the fuel tanks from the bottom wing roots to the fuselage, moving the centre of gravity forward, lengthening the fuselage and altering the tail surfaces.

The other new standard type, the Curtiss O-1 (Falcon), has satisfactorily passed all its service tests. Two additional models the O-1B and the O-11, have been procured for issue to service. An experimental model, the XO-12, with the Pratt and Whitney Wasp air-cooled engine is under test.

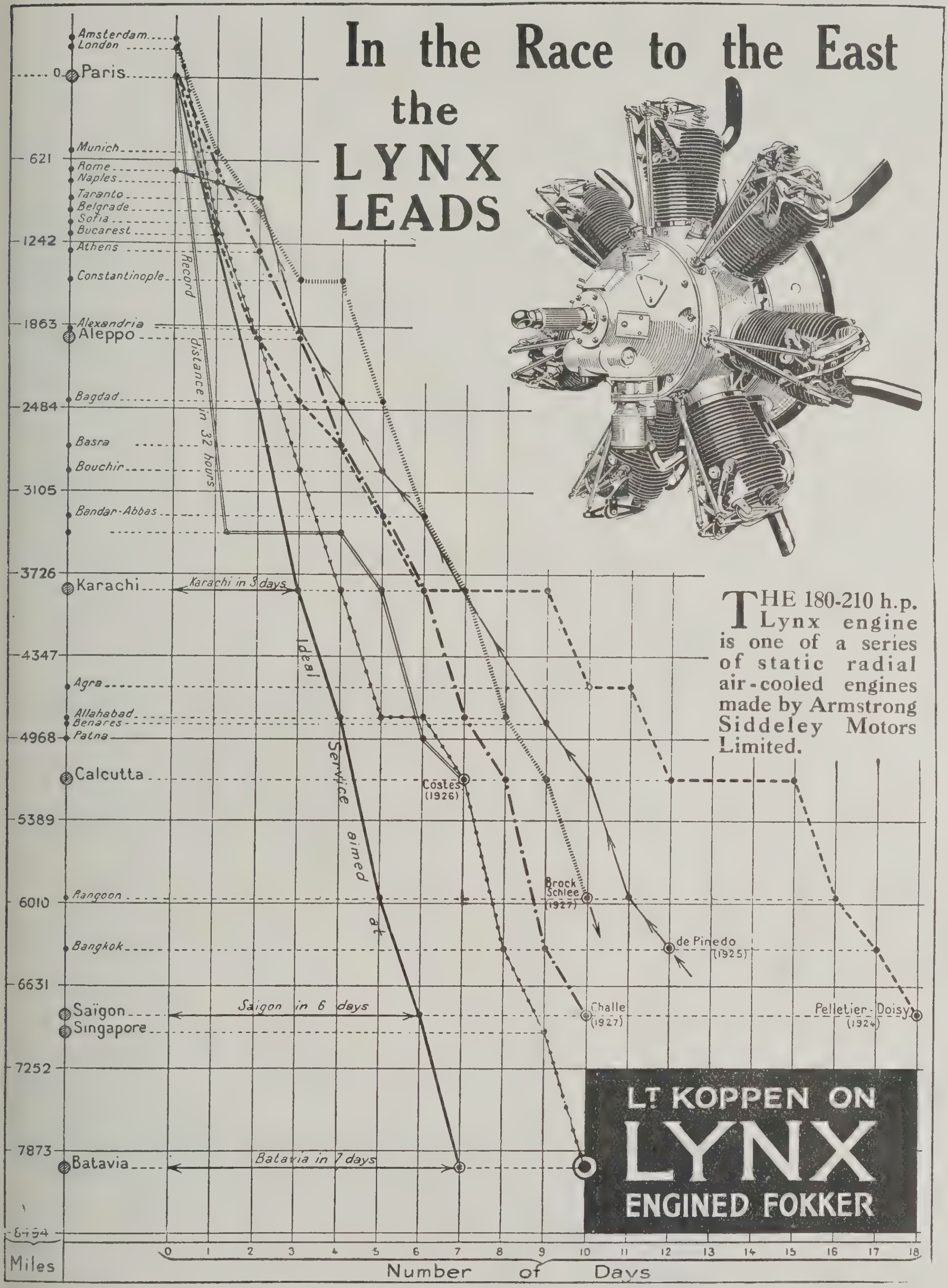
Five Thomas-Morse O-6, which are metal reproductions of the Douglas O-2, are under service test.

Service tests with the Loening Amphibian CO-A1 have been satisfactory, and this type has been adopted as standard for use in insular possessions and at coast stations.

A limited number of Keystone LB-1 bombing aircraft were acquired to replace the Curtiss NBS-1 type, which is rapidly becoming obsolete. The LB-1 did not prove successful for two reasons, firstly, because the single-engined type was not deemed as reliable as the twin-engined model, and secondly, because the 800 h.p. Packard engine led to considerable maintenance trouble.

A specification was issued to aircraft manufacturers to furnish several different types of twin-engined bombers for comparative test, and pending the adoption of one or more of these a small quantity of Keystone XLB-5 bombers, the LB-1, with two Liberty engines in place of the single Packard, was procured for service test.

Service tests with the Douglas C-1, C-1A and C-1C cargo aircraft proved that this type was satisfactory for service use except that the single-engined type is not considered



THE 180-210 h.p. Lynx engine is one of a series of static radial air-cooled engines made by Armstrong Siddeley Motors Limited.

Adapted from L Illustration.

ARMSTRONG SIDDELEY
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to possess the reliability of the multi-engined type. Three Fokker C-2 three-engined monoplanes were released to service test, and have proved satisfactory.

Certain of the more important accessories have received considerable attention at the Materiel Division, notably wheel-brakes, disc-wheels, skis and shock-absorbers.

In aerodynamical research important work has been done on stability investigation, airscrew and fuselage interference, tail-spin investigation and the compilation of the Flight Test Manual.

CANADIAN AIR MAIL PROPOSALS.

The Canadian Post Office Department is taking an active interest in Air Mails and they have decided to help materially. Their ideas run on two lines—firstly, giving mail services to remote communities which now have few and irregular air services owing to the paucity of their ground communications, and secondly, the running of regular air mail services between the main centres of population.

The first class had their beginning in services to outlying mining camps such as have been operating for the past two years.

One of these companies, Western Canadian Airways, has carried, since its inception in 1926, 1,200 passengers and 300,000 lbs. of freight from Sioux Lookout to Red Lake with an average of three aeroplanes. This company started with one machine, a Fokker Universal, in 1926. In 1927 it had three Fokker Universals, three Fairchild monoplanes and one D.H. Moth, and this fleet is being doubled this year.

Another such company is the Yukon Airways and Exploration Co., which in 1927 began carrying mails between White Horse and Dawson and Mayo with two Ryan monoplanes, cutting down the time of mail delivery over the 360 miles between White Horse and Dawson from two weeks to four hours.

Both these companies which have hitherto operated without Government assistance are now to be given regular contracts for the carriage of mail.

A weekly service is also proposed from Murray Bay to Seven Islands on the north shore of the St. Lawrence with a monthly trip to Anticosti Island, and another weekly service is suggested to the Magdalen Island in the Gulf of St. Lawrence from Moncton, New Brunswick. This latter service involves an open-sea crossing of fifty miles.

With regard to the experimental service operated during the past summer from Rimouski to Quebec and Montreal with the object of speeding up ocean mails, it has now been decided that a seaplane service is impracticable owing to the lack of sheltered water at Rimouski or Father Point, the pilotage station at the mouth of the St. Lawrence, added to which there is the impossibility of operating aircraft off the water either with floats or skis for about a month during the thaw or the freeze-up in the Spring and Autumn.

This service will therefore be operated by land machines fitted with interchangeable wheels and skis and tenders for its operation have been invited and were due to be received by the Post Office Department in the third week in January. It is hoped that this service will be operated twice weekly this summer with possible extensions from Montreal to Ottawa by one branch and to Toronto by another. Work has been started on an aerodrome at Rimouski and suitable aerodromes already exist at Ottawa and Toronto.

The Montreal aerodrome will be situated at St. Hubert which, when the new bridge spanning the St. Lawrence is completed in 1929, will be only six miles from the centre of the city. St. Hubert has been chosen as the site for the Canadian airship base and in the meantime it is being completed as a big public air terminal. It has a clear run in every direction of over a mile, and is perfectly flat with excellent surrounding country. Sheds are being erected which will be leased to air mail operators at moderate charges and every encouragement is being offered to aircraft constructors and operators to rent land and build sheds for assembly, test and commercial flying.

None of the above routes present any difficulties and the Department of National Defence are busy preparing estimates for their lighting, etc., as they must be run both by day and night.

In the West there is a prospect of a daily air mail service being established between Winnepeg, Calgary and Edmonton.

The Department of National Defence has an agreement with the Post Office for the making of a survey to determine the best route from Ottawa to Winnepeg to link up eastern and western Canada through Northern Ontario.

An investigation is being made for the Canadian Pacific Railway for a winter route between Halifax, N.S., St. John, N.B., and Montreal through the northern part of the State of Maine, U.S.A. This is a difficult proposition as the winter is shorter on the coast than it is in Montreal and therefore there is the possibility of deep snow in Montreal with none at Halifax. Both Halifax and St. John harbours are open all the year round so that seaplanes are practicable between these two points.

AVRO AVIANS FOR THE UNITED STATES.

A report in *Air Transportation* of New York for Jan. 2 states that the American manufacturing rights for the Avro Avian have been acquired by the United States Aircraft Co. of Spokane, Wash.

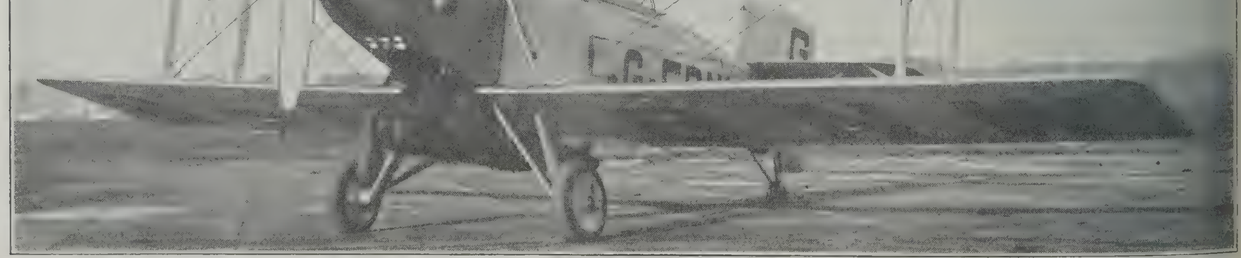
This company has recently been formed with a capital of $100,000 under the Vice-Presidency of Capt. H. J. Taplin who was associated with Mr. A. V. Roe in the very early days of flying. Capt. Taplin expects to build at least 2 Avians during the present year and to sell them at a price between $1,800 and $2,000 (£360 to £400) each.

Engines for these machines are to be built by the Washington Machinery and Supply Co. and are to follow in their design a European type of engine that has already proved successful.

AERIAL SURVEY IN PAPUA.

According to a report in *The Times* work on an aerial survey of Papua made in the interests of the Anglo-Persian Oil Company, has ended for the present season, but will be resumed after the monsoon. It is said that an area of 10,00 sq. miles has been covered, and that the geologist attached to the expedition prospected over an area of 30,000 sq. miles.

This particular survey has been carried out by officers of the Royal Australian Air Force, using two Supermarine Seagull Amphibians, with the assistance of Mr. Nason Jones, a geologist employed by the Anglo-Persian Oil Co. The object of the undertaking is to discover the structure and extent of the geological formations in which oil has already been found in Papua.



THE AVRO BUFFALO II.—A two-seat torpedo-bomber fitted with a 450 h.p. Napier Lion engine and slot and aileron control.

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THE ROYAL AIR FORCE.

The London Gazette.

Jan. 27.

General Duties Branch.—Wing Cdr. W. R. Read, M.C., D.F.C., A.F.C., is restored to full pay from half-pay (Jan. 19); Flt. Lt. J. A. Glen, D.S.C., is placed on the half-pay list, Scale B (Jan. 1 to June 30 inclusive); Flg. Off. J. Blackmore resigns his S.S. comn. (Jan. 25), V. F. Smyth, Lt., R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on return to Naval duty (Jan. 12); the S.S. comn. of Plt. Off. on probation B. G. Thompson is terminated on cessation of duty (Jan. 13).

Stores Branch.—A. H. E. Frost is granted a perm. comn. as a Plt. Off. on probation with effect from, and with seniority of, Oct. 19, 1927.

Medical Branch.—Temp. Capt. R. G. J. Charlesworth (Dental Surgeon, General List, Army) is granted a temp. comn. as Flt. Lt. on attachment to the R.A.F. (Jan. 9). He will continue to draw emoluments from Army sources; Flg. Off. C. J. S. O'Malley is promoted to the rank of Flt. Lt. (Jan. 14).

Memorandum.—Flg. Off. R. S. Broderick relinquishes his temp. comn. on ceasing to be employed with the Electrical Services Works Co. (Jan. 31).

Reserve of Air Force Officers.—General Duties Branch.—Flt. Lt. J. F. Stallard ceases to be employed with the Regular Air Force (Jan. 6). The following Flg. Offs. are transferred from Class A to Class C:—C. E. B. Winch (June 10, 1927); R. H. Rose (Jan. 22). The following Flg. Offs. relinquish their comns. on completion of service:—J. H. Taylor (Dec. 16, 1927); H. S. Eaton (Dec. 23, 1927). Flg. Off. A. L. Wilcox relinquishes his comn. on completion of service, and is permitted to retain his rank (Dec. 12, 1927); Flg. Off. G. Davis resigns his comn. (Jan. 24).

Appointments.

Week ending Jan. 30.

General Duties Branch.—Wing Commander W. R. Read, M.C., D.F.C., A.F.C., to R.A.F. Station, Upavon, pending taking over command, 19/1.

Squadron Leader S. P. Simpson, M.C., to No. 22 Group H.Q., Farnborough, 25/1

Flight Lieutenants M. M. Freehill, D.F.C., to C.F.S., Wittering, 17/1. S. T. B. Cripps, D.F.C., to No. 32 Sqdn., Kenley, 25/1. C. Rapley, to No. 1 School of T.T. (Apprentices), Halton, 27/1. G. A. F. Bucknall, to No. 19 Sqdn., Duxford, 23/1.

Flying Officers M. W. Goldie, to C.F.S., Wittering, 15/1. N. C. Ogilvie-Forbes, to R.A.F. Depot, Uxbridge, 16/1. G. C. Shepherd, to H.Q., Air Defence of Great Britain, Uxbridge, 19/1. H. E. E. Weblin, to R.A.F. Depot, Uxbridge, 7/1. E. C. Boucher, to No. 10 Sqdn., Upper Heyford, 3/1.

Pilot Officer A. F. Britton, to No. 2 F.T.S., Digby, on appointment to a S.S. Comn., 21/1.

Medical Branch.—Flight Lieutenants E. G. Howell, to School of Army Co-operation, Old Sarum, 2/2. D. B. Smith, M.B., to R.A.F. Station, Upper Heyford, 27/1. H. Penman, M.B., to No. 26 Sqdn., Catterick, 23/1. G. M. Anderson, M.B., to R.A.F. Station, Biggin Hill, 25/1.

Flying Officers N. I. Smith, M.D., to Station H.Q. and Storage Section, Andover, 26/1. J. P. Hederman, to R.A.F. Depot, Uxbridge, 2/2. E. A. Rice, M.B., to R.A.F. Station, Worthy Down, 26/1.

Stores Branch.—Squadron Leader F. E. J. Coates, to No. 1 Stores Depot, Kidbrooke, 19/1

Flight Lieutenant A. M. Saywood, to R.A.F. Base, Calshot, 14/1.

Accountant Branch.—Squadron Leader A. W. P. Phillips, O.B.E., to Armament and Gunnery School, Eastchurch, 24/1.

Flying Officer J. P. Cave, to R.A.F. Station, Duxford, 21/1.

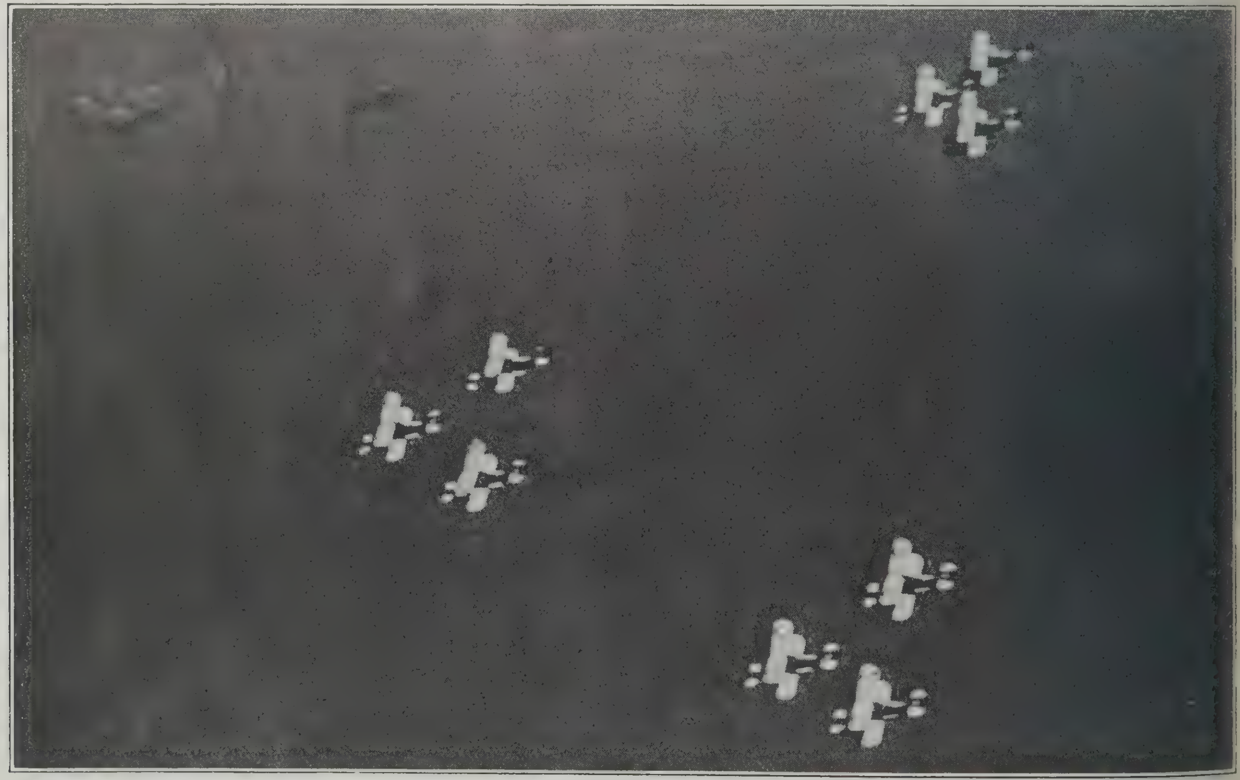
Pilot Officers R. D. Pratt, to R.A.F. Base, Calshot, 17/1. L. Chegwidden, to Station H.Q. and Storage Section, Andover, 17/1. F. C Rendle, to School of Photography, S. Farnborough, 17/1. N. Wallett, to M.A.E.E., Felixstowe, 17/1. G. H. White, to R.A.F. Station, Upavon, 17/1. R. L. M. Hall, to R.A.F. Station, Kenley, 17/1. V. H Lewis, to No. 9 Sqdn., Manston, 17/1. V. Matveieff, to No. 4 Stores Depot, Ruislip, 17/1. E. L. G. Le Dieu, to R.A.F. Station, Northolt 17/1. J. R. Ackers, to R.A.F. Station, Upper Heyford, 17/1.

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident at Helwan Aerodrome to a D.H.9a machine of No. 45 (Bombing) Squadron, Egypt, on Jan. 30, the passenger in the aircraft, No. 361890, L/AC. Harold Edwin Fisher, died from injuries. No. 335796, Sjt. Frederick Ernest O'Meara, the pilot, was seriously injured.

The Aden Command.

Group Captain W. G. S. Mitchell, C.B.E., D.S.O., M.C., A.F.C., who, according to *The Army, Navy and Air Force Gazette*, will probably be appointed to take command of the R.A.F. units in Aden, was born in Cumberland, New South Wales, in 1888, and educated at Wellington College. He entered the 3rd Battalion The Devon Regiment in 1906 and was granted a regular commission in the Highland Light Infantry in 1909. He was seconded to the Royal Flying Corps in December 1913, after learning to fly on a Vickers biplane at Brooklands. His Royal Aero Club certificate, No. 483, is dated May 16, 1913. He flew to France with No. 4 Squadron, R.F.C., on Aug. 13, 1914. He was appointed Flight Commander R.F.C. in January 1915, and promoted to the rank of captain in the H.L.I. in May 1915. He was awarded the Military Cross in 1916 for distinguished service in the field, was appointed a Companion of the Distinguished Service Order in 1917 for distinguished service in the field, and was awarded the Air Force Cross in the King's Birthday Honours of 1919 for distinguished services during the War. He was four times mentioned in dispatches during the War 1914-18. After the Armistice he resigned his Army commission and was appointed to a permanent commission in the R.A.F. with the rank of Wing-Commander. He was promoted to Group Captain in July 1924. In August 1920 he was appointed to command No. 1 (Indian) Wing, Peshawar, and in 1924 he was made a Companion of the British Empire (Military Division) for valuable services in the field in con-



FLYCATCHERS.—A Formation of Fairey Flycatcher single-seat amphibians of the Fleet Air Arm on the China station. The Fleet Fighter Units equipped with these machines are No. 404 (B) Fleet Fighter Flight in H.M.S. "Argus" and No. 401 Fleet Fighter Flight in H.M.S. "Tamar."

SUPREMACY.

9 WORLD'S RECORDS. The "ROHRBACH-ROLAND" has nine records for Speed, Endurance, Altitude and Load-carrying to its credit.

These records demonstrate the qualities of the finest commercial aeroplane in the world. All these records were made with the same type of aeroplane and engine as are in service on the most important air lines in Europe.

nection with the military operations in Waziristan from January 1922 to April 1923. In March 1924 he was restored to the Home Establishment to command No. 1 Flying Training School, Netheravon, and in January 1925 he was appointed to command the Station Administration, R.A.F., Halton.

The first announcement of the transfer of the defence organisation at Aden from the War Office to the Air Ministry appeared in The Aeroplane of Jan. 11.

Wing-Commander Read.

Wing-Commander W. R. Read, M.C., D.F.C., A.F.C., whose appointment to the R.A.F. Station, Upavon, pending taking over command, is dated Jan. 19, 1928, was born in 1885 and educated at University College School and Jesus College, Cambridge. He entered the 1st Dragoon Guards from the Hampshire Yeomanry in 1907. He learned to fly on a Bristol biplane on Salisbury Plain, and his Royal Aero Club certificate, No. 463, is dated April 12, 1913. In April, 1914, he was seconded to the R.F.C., and flew to France with No. 3 Squadron on Aug. 13, 1914. He was appointed Flight-Commander in February 1915 and Squadron-Commander in March 1915. He returned to the 1st Dragoon Guards in April 1917, and was again seconded to the R.F.C. in September 1917. He was awarded the Military Cross in 1915 for distinguished service in the field, and the Distinguished Flying Cross and the Air Force Cross in 1919 for distinguished services during the War. He was awarded a bar to the A.F.C. in July 1920 for gallant and distinguished service with No. 216 Squadron in Palestine, and a second bar to the A.F.C. in the New Year Honours of 1922. He was appointed to command No. 216 Squadron in Palestine in August 1919, and in August 1922 he was appointed to the staff of the R.A.F Cadet College, Cranwell. In 1923 he was appointed to the staff of No. 1 School of Technical Training (Boys), Halton, and in 1924 he was appointed to H.Q., R.A.F., Halton, for staff duties. He was placed on the half-pay list on Dec. 1, 1927, and restored to full pay on Jan. 19, 1928.

Cadetships and Prizes.

The Air Ministry announces that Aircraft Apprentices A. Earle (Beworthy, Devon), C. J. Giles (Leyton, E.10), W. Sawyer and W. N. McKechnie (Golders Green, N.W.2), from No. 1 School of Technical Training (Apprentices), Halton, and AA. F. Wicks (Lacock, Wilts), from the Electrical and Wireless School, Flowerdown, have been selected for cadetships at the Royal Air Force Cadet College, Cranwell, on the results of the examinations held on completion of their three years' training as aircraft apprentices.

Sir Charles Wakefield Scholarships, valued at £75 each, have been awarded to Flight Cadets A. Earle and C. J. Giles, and the Hyde-Thomson Memorial Prize, valued at about £33, to Flight Cadet F. Wicks.

Vacancies for Apprentice Clerks.

The Air Ministry announces :—

Sixty vacancies exist in the R.A.F. for well-educated boys, between the ages of 15½ and 17 to enter as apprentice clerks. Aproximately 40 of the posts will be filled by means of an open competition which will be held by the Civil Service Commissioners in April at various centres and the remaining 20 by direct entry of boys who have obtained an approved school certificate. Successful candidates will be required to complete a period of 12 years' Regular Air Force service after reaching the age of 18, in addition to the training period. At the age of 30 they may return to civil life or may be permitted to re-engage to complete time for pension.

Boys entered under this scheme undergo a two years' course of training in clerical duties, typewriting, shorthand, book-keeping and practical office routine, during which time their general education is continued under a staff of graduate teachers.

The apprentice clerks are paid 7s. per week for the first year and 10s. 6d. per week afterwards until they have both attained the age of 18 and have been posted for duty after passing their final examination. The subsequent starting rates of pay, varying from 21s. to 31s. 6d. per week, depend upon the degree of success achieved at this examination. In addition, they receive free board and lodging.

Detailed information regarding the apprentice clerk scheme can be obtained from the R.A.F., Gwydyr House, Whitehall, S.W.1.

The Far East Cruise.

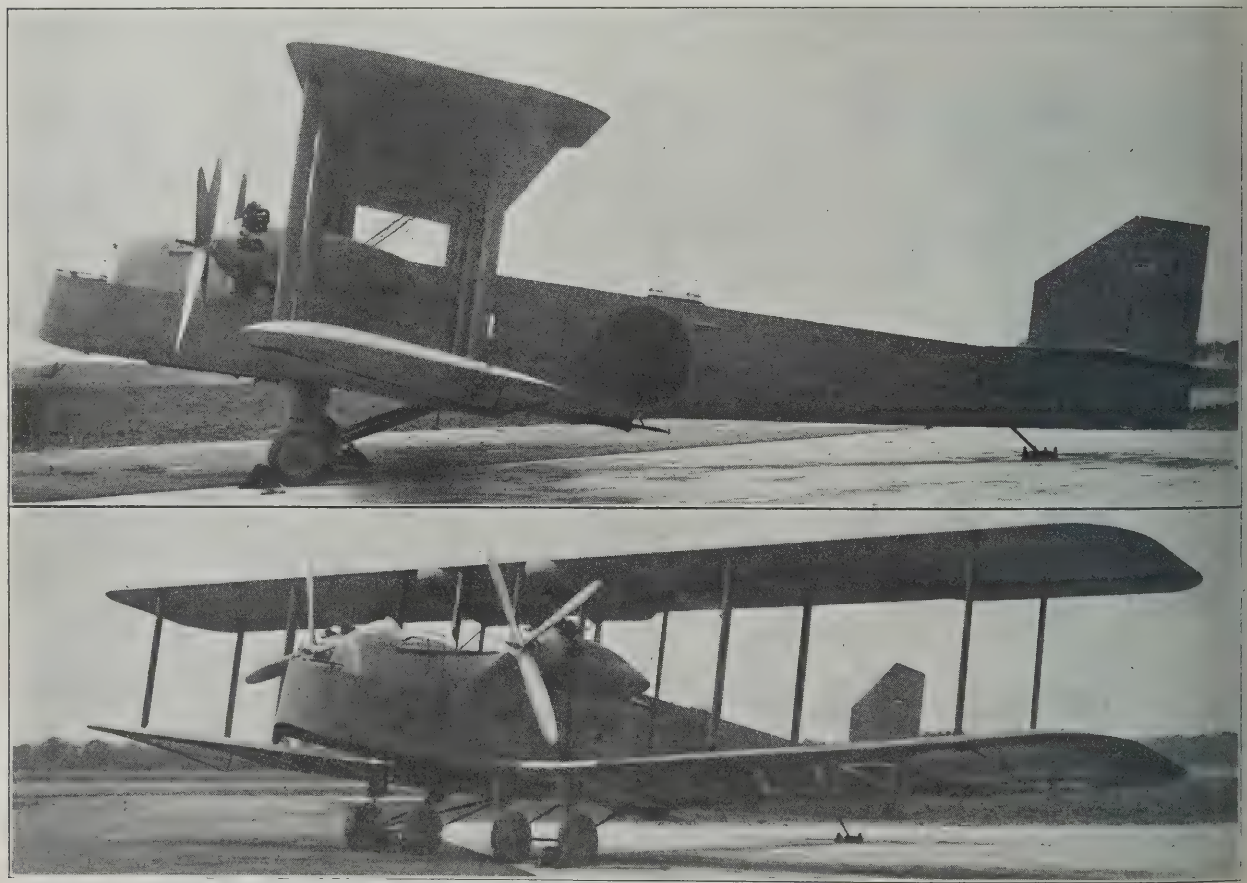
The Service cruise of the four Supermarine Southampton flying-boats (Napier Lion engines) under the command of Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17, arrived at Calcutta at midday on Jan. 27. They alighted on the River Hooghly, near Barrackpore.

Correspondence for the *personnel* of the Flight should be addressed, R.A.F., Far East Flight (Flying-Boats), or R.A.F., Far East Flight (Base Party), as the case may be, both being care of the G.P.O., London.

The Mohmand Operations.

A Routine Order Supplement in Air Ministry Weekly Orders states :—

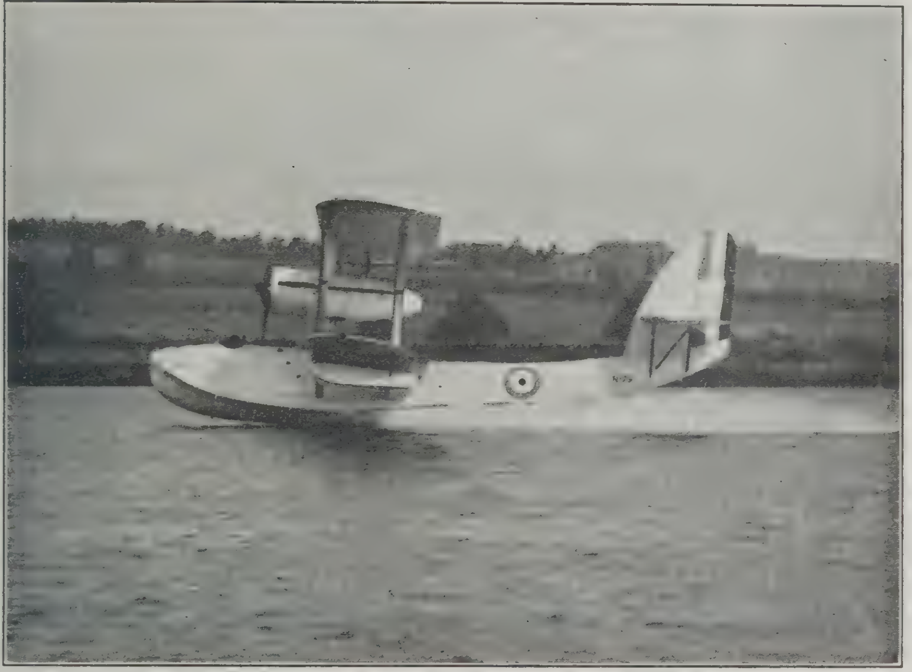
"The names of the undermentioned officers have been brought to notice in a report from His Excellency, the Com-



THE HANDLEY PAGE HINAIDI.—A four-seat night bomber (two 480 h.p. Bristol Jupiter VIII geared engines). No. 10 (Bombing) Squadron will eventually be equipped with machines of this type.

SHORT

ALL-METAL



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DESIGNED and built by the pioneers of British all-metal aircraft, the "Singapore" is the largest and most successful super flying-boat of all-metal construction yet produced.

IN range of flight, speed, and weight carried, it is possibly without equal in the flying-boat world; and possesses an unusual degree of automatic stability.

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mander-in-Chief, India, dated July 5, 1927, for services rendered in the Mohmand operations in June, 1927:— Wing Cdr. A. A. Walser, M.C., D.F.C., Sq. Ldr. A. J. Capel, D.S.O., D.F.C., Flt. Lt. J. W. Baker, M.C., D.F.C., Flg. Off. (now Flt. Lt.) R. W. M. Hall and Flg. Off. (Lt., R.A.) L. E. Cutforth (since returned to Army duty).

At the time of these operations Wing Cdr. Walser was commanding No. 1 Indian Wing at Peshawar, Sq. Ldr. A. J. Capel was commanding No. 5 (Army Co-operation) Squadron, Risalpur, Flt. Lt. J. W. Baker was in No. 60 (Bombing) Squadron, Kohat, and Flg. Offs. R. W. M. Hall and L. E. Cutforth were in No. 5 (Army Co-operation) Squadron.

The Army Senior Officers' School.

The following officer of the R.A.F. has joined the Army Senior Officers' School at Sheerness for the first of the three courses arranged for 1928: Sq. Ldr. C. H. Elliott-Smith, A.F.C.

Sq. Ldr. C. H. Elliott-Smith, A.F.C., has been in command of No. 56 (Fighter) Squadron, North Weald, since Aug., 1926.

Army Co-Operation Courses.

Four short courses for senior officers of the Army, Navy, Air Force and Territorial Army will begin at Biggin Hill on Apr. 2, Apr. 30, May 21 and Oct. 29, for instruction in the general principles of anti-aircraft defence.

A course of instruction for officers in aircraft practice in relation to artillery, infantry, cavalry, tanks, reconnaissance, photography and bombing will be held at the School of Artillery, Larkhill, and the R.A.F. School of Army Co-operation, Old Sarum, during the coming year.

The Japanese Interpretership Examination.

An Air Ministry order states that the undermentioned officer has passed the allotted examination in Japanese:—Flt. Lt. R. W. Chappell, M.C.

Flt. Lt. Chappell was posted for Special Language Study in Japan on Oct. 9, 1925.

R.A.F. SPORTS AND PASTIMES.

Rugby Football

R.A.F. versus Leicester:—Leicester beat the R.A.F. at Leicester on Jan. 25 by two goals and two tries (16 points) to a goal and two tries (11 points). The R.A.F. were leading by a goal to nothing at half time.

It is difficult to judge the progress of the R.A.F. team because of the continual changes in the side. In this match again four of the regular players were missing. Odbert and Beamish were left out because they were both playing for Ireland on the following Saturday; Christie was unable to play and Vines was playing Hockey for the R.A.F. Although it is quite permissible for the two Irish caps to be preserved from the claws of the Tigers (the name given to the Leicester team by their supporters) it seems hard luck on the other backs for one wing threequarter to be out of the team playing hockey at such a critical period of the training of the team.

It so happened that the partnership between Norwood and Russell at half-back proved a much better affair than the hopeless combination of Odbert and Russell at the Cambridge match. The selectors for the team against the other Services will evidently have to choose between speed and manœvrability on the one hand and strength and experience on the other.

At threequarter Coote again was good in defence but uncertain in attack. Massey was equally good in attack and defence but his co-operation is faulty and he is inclined to do too much on his own. Hodder and Bremridge were both fast and reliable. Altogether the backs want more combination practice. This changing about should have been done during the trials before Christmas and by this time the R.A.F. would have had a good team.

The forwards were well together and formidable in the loose. The advantage provided by the extra tonnage of Chichester in the scrum was, unfortunately, lost by the total inability of the front line to execute any hooking.

As there was a complete lack of the talking and shouting by the players, which was a feature of the Cambridge game, it may be assumed that the Cambridge team were responsible for the community Rugger on January 18.

The game started with an unprovoked attack on Flt. Lt. Elmhirst who was touch-judging. When he had recovered and accepted the apologies of both sides Massey took a pass and made a dash for the line and wriggled past several of the opposition before he was stopped. Chick broke away from the scrum with some of his famous footwork but kicked ahead too far. A rush by the Leicester forwards was supported by their threequarters but Massey intercepted a pass and found touch. A free kick against Leicester failed to find touch. Coote tackled a man and held him while Chick ran up and took the ball away.

Brilliant combination work on the Leicester right wing was stopped by good Air Force tackling. Norwood took some astonishingly difficult passes, one of them about knee high, and made several good openings which the threequarters failed to finish off. Coote intercepted a Leicester pass and passed far out to Chick, who fielded it with on hand and dashed for the line to score. Chick kicked a goal. Leiceste tried to drop a goal from a kick against the Air Force for off-sid but the ball went wide

Russell snatched at a pass from the Leicester scrum half and hande it to Coote who was tackled and threw it away to be grabbed up b another Leicester player. Another free kick against the Air Forc missed the goal by inches. Hale-Munro fielded a long kick with on hand and made ground before finding touch. Chichester started really good passing movement from a line out but it was crowded ou on the opposite wing.

The Air Force forwards were beating the Leicester forwards a round except for the hooking which was getting the ball for Leiceste against the run of the play. Another kick against the Air Forc found touch but the Air Force regained the lost ground with sho passing between their forwards.

In the second half the R.A.F. had a strong wind against them an it began to rain. Barlow scored on the right wing for Leiceste but there was no goal. Leicester began to push and gained a lot ground. Coote broke away from a scrum and passed to Constantin who scored. No goal. A combined attack by Russell and Chick ende in a forward pass. A burst by the Leicester forwards was stopped b Collins, who went down on the ball near the line.

Buckingham got through from a scrum after selling a double dumm bought by Russell and Hale-Munro, and scored. No goal.

It took six Tigers to bring down Chichester in a line-out. Th Leicester threequarters got on the move several times and the gam was well in the R.A.F. twenty-five. Buckingham got away agai and passed to Barlow who shook off two Air Force backs and score The try was converted.

By this time the rain had made the surface of the groun treacherous and the ball was wet and greasy. The R.A.F. forwar started using their feet more and Constantine and Chick got the ba well away. Massey gathered and ran straight through the Leicest defence and gave Hodder a beautifully-timed pass to score. Chic failed with the goal kick.

The Air Force pressed their attack in the last few minutes an Munro gained twenty-five yards with a swerving run but the mov ment broke down with a forward pass by Russell and the game ende with the smile on the face of the Tigers.—C. M. MCA.

The R.A.F. team were:—Flg. Off. T. A. Hale-Munro; AC. T. Coote, AC. D. Massey, Flg. Off. F. S. Hodder, Flg. Off. C. H. Bremridge; Flg. Off. J. Norwood, Sq. Ldr. J. Russell; Flg. O C. J. S. O'Malley, F-S. G. F. Cockell, Sjt. A. C. Hall, Flt. Lt. C. Adams, Plt. Off. H. A. Constantine, L-AC. G. Collins, Flg. Off. P. Chichester, Flt. Lt. J. S. Chick.

Association Football.

R.A.F. versus Football Association XI:—The R.A.F. wer beaten by the F.A. XI at Uxbridge on Jan. 25 by 7 goals t 3. *The Times* account of the game states:—

In front of goal the R.A.F. forwards played precisely the wron game, keeping the ball close and manœuvring too elaborately f position before shooting—a fatal mistake with the ground as it w and against fast and resolute backs. AC. J. Ewers was not a succe at centre-forward, but the two inside forwards, AC. L. Oates an AC. L. S. Smith, worked hard and well—Oates, indeed, would hav had a really good match had he been more prepared to take chanc in his shooting. L-AC. R. J. Robinson at centre-half would be really good footballer were he a yard or so faster. W. A. Hill tire him out before the end of the game, but at the beginning he covere a great deal of ground and never gave a pass unless he had som constructive purpose in mind. The backs were rather run off the feet by the fast-moving F.A. forwards, but AC. L. W. Quadlin although he let through seven goals, might pardonably have l through a good many more. The F.A. team, who were a man sho for a considerable time, improved as the game went on, and at th end they were doing very much what they liked with the ba and with their opponents.

The R.A.F. team were:—AC. L. W. Quadling, goal; AC. A. G. West and Flt. Lt. S. N. Webster, backs; Sjt. R. Stewart, L-AC. R. Robinson, and Cpl. R. W. Baldwin, half-backs; Sjt. E. A. Franci AC. L. Oates, AC. J. Ewers, AC. L. S. Smith, and AC. G. Coake forwards.

Hockey.

R.A.F. *versus* R.E.—The R.A.F. beat the Royal Enginee at Stanmore on Jan. 25 by 4 goals to 3.

Vines and Murphy were the outstanding players for th R.A.F. Maher and Crowther also played well. As a tea the R.E.s showed better combination, a particularly goo game being played by Sydenham.

The game opened quietly, the R.A.F. getting the better of th exchanges. The first point of interest came about 10 minutes aft the start, when a fine movement by the Sapper forwards was frustrat by Murphy at back.

Two unsuccessful attempts by the R.A.F. shortly followed, aft which Jacobs opened the scoring for the R.E.s The R.A.F. then miss scoring on two occasions. Vines at outside right was playing a excellent game for the R.A.F. making several openings which ho ever were not taken advantage of by the inside forwards. The R.E were leading at half-time by 1—0.

After the interval the play improved and as the result of a ve good run by Vines, Courier equalised for the R.A.F. The game co tinued to improve and became very fast and a further goal for th R.A.F. was added by Hampton. Later Denning scored for th R.E.s. Shortly after this Stevenson gave the R.A.F. the lead wi a nice first-time shot but Jacobs immediately equalised the score f the R.E.s.

Two minutes before time Hampton scored the winning goal, makin the final score R.A.F. 4, R.E.s 3.

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THE STEPS TO VICTORY.

The meeting of the Royal Aeronautical Society, held on Thursday, Jan. 26, at which Mr. R. J. Mitchell, chief engineer of the Supermarine Aviation Works Ltd., described the development of the Supermarine S.5, Capt. G. S. Wilkinson, of D. Napier and Son Ltd., told how the racing Napier engine was developed from the famous Lion, and Mr. P. A. Ralli, of the Technical Staff of the Fairey Aviation Co. Ltd., explained some of the problems of airscrew design for this machine, was shorn of some of its possible interest by the refusal of the Air Ministry to permit the publication of any precise technical data concerning either machine, engine, or airscrew.

The meeting was attended by one of the largest audiences that one has yet seen at the Royal Society of Arts Rooms, and the first, and perhaps most important, business of the evening, that of presenting to Mr. Mitchell, Capt. Wilkinson, and Mr. Ralli the Silver Medal of the Royal Aeronautical Society for their collaboration in the production of the fastest aeroplane in the world was performed by the Chairman, Colonel the Master of Sempill, to the accompaniment of duly enthusiastic applause.

THE MACHINE.

Mr. R. J. Mitchell said that the first stage in the development of the S.5 from the S.4 of 1925 was the production of models and the making of many experiments in the wind tunnels of the N.P.L. and the R.A.E. Unfortunately, the results of these experiments must not be revealed.

The main changes which led to the development of the S.5 from the S.4 were :—(1) Lowering the wing on the fuselage, (2) adopting a system of wire bracing between floats, wing, and fuselage, (3) reducing the sectional area of fuselage and floats, (4) the fitting of wing surface radiators, (5) the use of an engine of increased power, with gearing to give better airscrew efficiency.

The reason for lowering the wing was to improve the pilot's view, which was not good on the S.4. The higher position of the wing on S.4 probably gave a less resistance and a loss of speed of about 3 m.p.h. from the lowered wing is believed to have been incurred.

The change to wire bracing was dictated by a number of reasons. The unbraced wings and undercarriage of S.4 were very heavy, and it was found difficult to make the wing strong and rigid without using a thick and high resistance section at the root. The use of bracing reduces the structure weight from 45 per cent. of the total in S.4 to 36 per cent. in S.5, cut out two struts between floats, and reduced the frontal area of the four main float struts. Against these savings must be set the addition of fourteen wires. The overall gain of speed from this change is estimated to have been 3 m.p.h.

The reduction in the frontal area of the fuselage on S.5 was about 30 per cent. This was made possible by the re-design of the engine and the placing of the fuel in a float. This last change lowered the C.G. of the machine, improved stability both in the air and on the water, and partly balanced engine torque.

The floats were reduced in sectional area by about 14 per cent. by using a smaller reserve of buoyancy. This reduction was partly made possible by the putting of fuel into the starboard float, which reduced the immersion of the port float under engine torque. An increase in speed of 4 m.p.h. is attributed to the lower resistance of the floats.

The reduction in body and float resistance was entirely the result of the smaller sectional area, and not of improved shape.

Wing surface radiators were first used in the Schneider Trophy competition by the Americans in 1923, and gave to these machines a very large increase in speed. These radiators had corrugated skins, which increased the surface exposed to air friction. As 70 per cent. of the resistance of a high-speed wing is skin-friction, and the corrugations nearly double the area of the wing surface, there is a large increase in wing resistance caused by such radiators. As a result of much experiment wing radiators with a flat outer surface were produced for the S.5. The great difficulty was that of making this flat surface rigid enough to stand the very heavy air-loads on the wing without making the radiator excessively heavy.

An estimated increase in speed of 24 m.p.h. was attained by using these radiators instead of the Lamblin radiators of the S.4.

Increased power of the new engine and the higher efficiency of the grand airscrews gave a further speed increase, estimated at 30 m.p.h.

The fuselage of the S.5 is built entirely of duralumin. Except for two strong frames to which the wing spars are attached, the strength of the fuselage lays almost entirely in the skin plating. Internal stiffeners of very light "U" section are fitted throughout at about 8-inch centres throughout the length of the fuselage. Most of the plating has but a single skin, but in some parts three thicknesses o 18-gauge sheet are used.

The floats are also of duralumin, except for the centra section of the starboard float, which is of steel, and forms the petrol tank. The floats are built on one central fore-and-aft bulkhead, with light transverse frames at abou 2-ft. centres.

The wings are of wood, with the usual two spars, and are entirely covered with ⅛-in. three-ply under the radiators which cover practically the whole wing surface. A diagona member is fitted between front and rear spar beyond the bracing-wire attachment to stiffen the wing against torsio at the tip.

After this very brief review of S.5, Mr. Mitchell considered how further increases in speed might be attained To do this he considered the effect of reducing resistance increasing landing speed, increasing h.p., decreasing structure weight, and decreasing engine weight.

Equal reductions in all these will give an increase o speed to an extent decreasing in the order in which the items are named. Thus, taking an equal improvement i each case, 12½ per cent. decrease in resistance would give 12.1 m.p.h., 12½ per cent. increase in landing speed 9. m.p.h., 12½ per cent. increase in h.p. 8.6 m.p.h., 12½ pe cent. decrease in structure weight 5 m.p.h., and 12½ pe cent. decrease in engine weight 3.5 m.p.h.

Thus the total effect of a 12½ per cent. improvement i all these factors would give 38.9 m.p.h., which is not more than is required to maintain the average rate of increase i speed between one race and the next.

Provided that the Air Ministry again give their suppor in the effort to defend the Trophy in 1929, Mr. Mitchel expressed the belief that we should be able to hold our own

THE ENGINE.

Capt. Wilkinson remarked that there was a great divergence of opinion among experts as to the best form o engine for racing machines. Some believed that a Ve type was essential, but the Napier firm thought that i view of their experience with the Lion broad-arrow type i was wise to stick to that type.

Their first procedure in designing the new engines wa to make a drawing of a fuselage of the smallest size into which it seemed possible to house a pilot, and fitted with nose of very fine lines. (Mr. Mitchell's S.5 fuselage wa in fact a little smaller than this original lay-out.)

The engine was then re-designed to fit into this fuselag with the minimum interference with its shape. The cylinder blocks obviously had to project beyond the fuselag lines. They were therefore made as small as possible, an arranged to have a smooth exterior needing no additiona external cowling.

The magnetos were arranged at the front of the engin and mounted parallel to the crankshaft to keep inside th width of the minimum fuselage. The water system wa altered to avoid water-pipes above the highest water space

When the engine had been remodelled satisfactorily i such respects a model of the fuselage with engine wa made and tested for resistance.

Concurrently tests were made to find out how the h.p output could be increased to the maximum extent.

Increased compression ratios and increased speed wer both found to be possible, but led to difficulties with th ignition system. A number of types of special sparkin plugs had to be tested before a satisfactory type could b evolved.

Fuels presented a difficulty. The compression ratio use was 10 to 1, and tests with both fuels containing a hig proportion of benzol and of tetra-ethyl-lead were tried. Th high benzol-content fuel gave carbon deposits on plugs, an the tetra-ethyl-lead fuel gave lead deposits. Finally a compromise fuel containing 25 per cent. of benzol and 0.2 pe cent. of tetra-ethyl-lead was found to be satisfactory.

In the original scheme it was decided to have no reduction gear for the airscrews. After manufacture of th engines had begun it was decided that better results coul be obtained with a reduction-gear. As the machines wer by this time partly built, it was essential that the introduction of gears should not mean any serious change in th aircraft, and therefore a type of gear in which the airscre shaft was co-axial with the crankshaft had to be used.

This was accomplished by using a gear similar to th back gear of a lathe, with a lay-shaft above the crankshaf and coming within the fairing of the central cylinder block

THE AIRSCREWS.

Mr. Ralli said that the exceptional values for h.p., engin revolutions and forward-speed required made the design o airscrews for the S.5 a complex problem. If scale effec and slip-stream interference could be ignored, the best airscrew for given h.p., revolutions and forward speed was a once determinable. But the airscrew computed in this wa would for racing conditions have a very high tip-speed leading to poor efficiency.

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The WESTLAND WIDGEON

When losses due to tip-speed were brought into account it was found that an airscrew of very much smaller diameter was required for best efficiency. But on this best diameter for the S.5 some 30 blades of the usual proportion would have been required to absorb the engine-power. Also with so small a diameter and so concentrated a slip-stream the added drag of the body in the slip-stream would have been prohibitive.

It was not possible to calculate with any useful accuracy what these slip-stream losses would be, but it was clear that the losses caused by high tip-speeds rendered desirable a smaller diameter than that indicated by ordinary design methods, whereas the losses caused by resistance in a small diameter slip-stream made it desirable to increase diameter.

Therefore the method adopted for the design of the Fairey airscrews for the S.5 was to start from a screw designed from ordinary wind-channel data, ignoring the effects of increased tip-speeds and body interference. Using this as the basis, others somewhat similar but venturing out to various degrees to the regions of extra high tip-speeds on one hand, and concentrated slip-stream on the other, were also made, and a final selection made after tests of the various types.

Airscrews of the type developed for this race had a remarkable characteristic at the lower end of their forward-speed range. They had necessarily a very high pitch-diameter ratio, and when running with the aircraft stationary the blades were completely stalled. In the calculated characteristics of these screws the thrust fell to very low values at about one-third of the designed top speed, and, in fact, one of these airscrews failed to take the machine off in a dead calm, despite the very low power loading of about 4 lbs. per h.p.

In his concluding paragraphs Mr. Ralli expressed the opinion that with the present arrangement of airscrew, engine and aeroplane structure only minor improvements in airscrew efficiency for very high speeds were possible. It seemed probable that really important improvements might be possible if a deliberate departure from the present arrangement were made. (Mr. Ralli here appears to refer to the possibility of using pusher instead of tractor airscrews.)

The discussion was confined to expressions of appreciation of the work done by the three authors and enquiries as to the reason why the Air Ministry had so circumscribed the authors in their description of that work.

THE RACING LION

The following information concerning the special Napier engines built for the 1927 race for the Schneider Trophy, which was not included in Capt. Wilkinson's paper before the Royal Aeronautical Society, has been issued by D. Napier and Son Ltd.

The racing engine has three rows each of four cylinders of the same bore and stroke (5½ in. x 5⅛ in.) as those of the standard Lion engine. These run at a compression ratio of 10 to 1 against 5.8 to 1 for the high compression standard engine.

The overall dimensions of the racing engine are 2 ft. 10½ in. high, 3 ft. 2 1-7 in. wide and 5 ft. 6¼ in. long against 3 ft. 3 in. high, 3 ft. 6 in. wide and 5 ft. 1 in. long for the normal engine, thus giving a very marked decrease in the frontal area required to enclose them. In addition to the reduction of overall height and width, the racing engines have a clear way between cylinder blocks, whereas the gap between cylinder rows in the standard engine is mainly filled by auxiliary gear of one kind or another.

The racing engine runs at 3,300 r.p.m. and develops 875 h.p. This compares with 2,000 r.p.m. and 475 h.p. for the high compression Lion of service type. The weight of the ungeared racing engine is 835 lbs.—or at the rate of 1 h.p. for .954 lbs. The engine in the Supermarine S.5 which won the race was fitted with a reduction gear of approximately 1.3 to 1 and weighed 920 lbs. or 1.05 lbs. per h.p. The normal Lion (high compression) weighs 940 lbs. or 1.95 lbs. per h.p.

The fuel consumption of these engines in racing condition is 50 gallons per hour, and the oil consumption about 3 gallons per hour. The fuel consumption—about .456 pints per h.p.—is abnormally low.

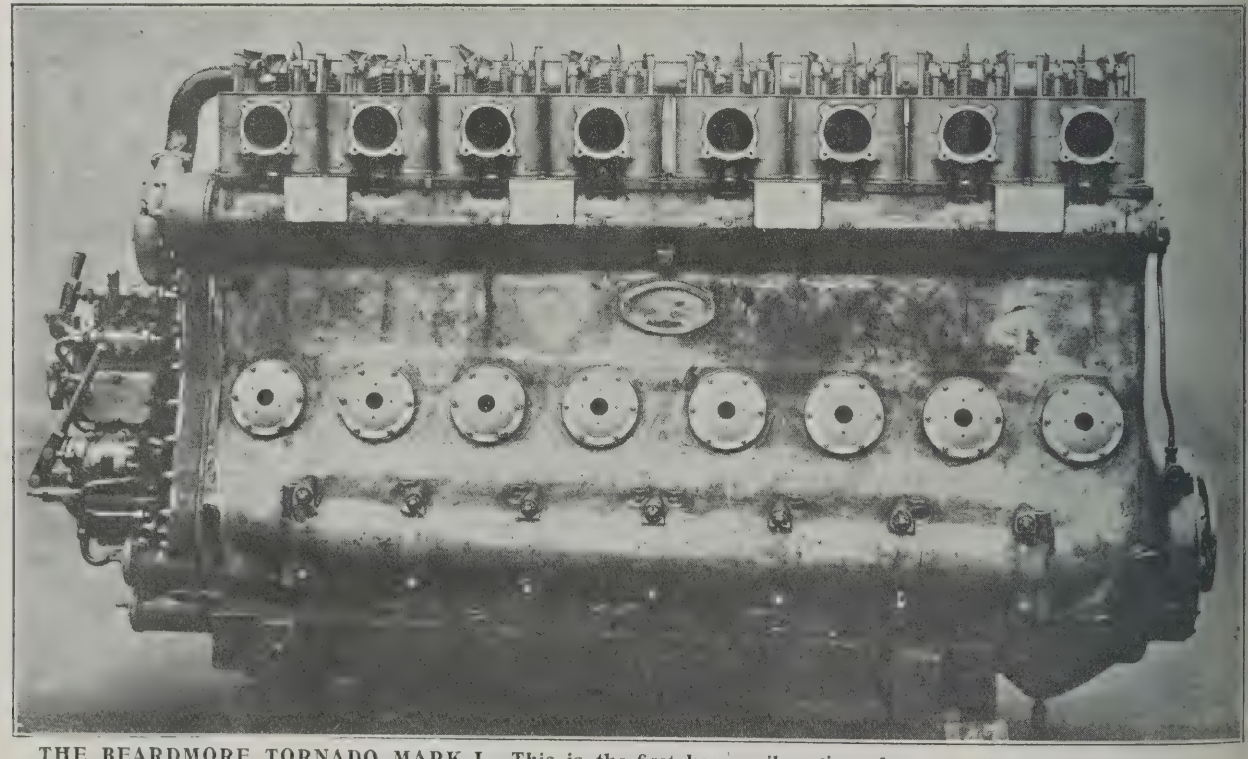
An engine of the same type has recently been supplied to Capt. Malcolm Campbell and is to be installed in the racing car in which he is to attack the World's speed record in Florida in the near future. There is thus a distinct probability that this type of Napier engine will shortly hold the World's records for speed both in the air and on the land. It will remain only for a racing Napier to be put into a racing motor-boat to complete the record of Napier supremacy in speed.

OPPORTUNITIES IN AUSTRALIA.

A well-known and old-established air transport company in Australia is requiring a few pilots who would be willing to go out to Australia for at least five years for employment on their air routes.

Recent flying and cross-country experience is essential and applicants should be between 25-32 years of age. They should have had at least 750 hours in the air, a good proportion of which should have been on scouts, although additional experience on heavy types will be an advantage.

Will anyone interested in the above please communicate with this office?



THE BEARDMORE TORNADO MARK I.—This is the first heavy oil engine of compression ignition type concerning which it has yet been possible to publish authentic particulars. It has eight cylinders, 8¼ inch bore by 12 inch stroke, develops 650 normal and 720 maximum h.p. at 1,000 and 1,100 r.p.m. respectively for a weight complete of about 3,000 lbs.

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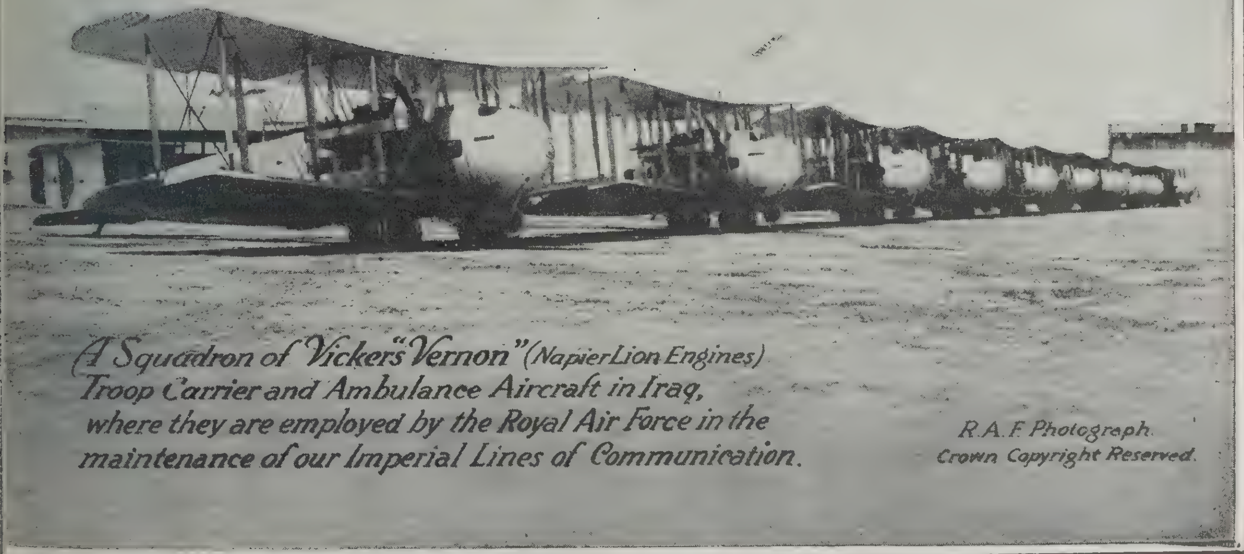


A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph. Crown Copyright Reserved.

THE BRISTOL MERCURY SERIES I ENGINE.

The Bristol Mercury Series I engine is the latest development of the series of air-cooled radial engines produced by the Bristol Aeroplane Co. Ltd., at their Filton Works. It is remarkable in that it was produced first of all as a specially-boosted type for racing purposes, whereas in the majority of cases racing engines are produced by tuning-up types already developed in service or commercial types.

The Mercury Series I was the engine fitted to the Short Crusader which came to an unfortunate end at Venice just before the race for the Schneider Trophy. During the extended trials of that machine this engine gave most satisfactory results—a fact which augurs well for the more normal engines of similar type which are to succeed the Mercury I.

The Mercury resembles the famous Jupiter engine in being a nine-cylinder single-row air-cooled radial. It has the two-piece crankshaft and the solid big-end assembly of the Jupiter Series VI type.

But it has been still further reduced in diameter, partly by shortening the stroke, partly by a complete re-design of the cylinder-heads and valve gears, and at the same time the output has been increased in part by increasing the speed of rotation, and in part as the result of the change of cylinder design and a consequent increase in mean effective pressure.

In the racing engine this output was still further increased by the addition of a geared supercharger fan used for ground boosting purposes, and the combined effect of these various improvements raised the value of this M.E.P. to a figure which must easily be a record for an air-cooled engine.

The Mercury I has cylinders 3¾ inches bore by 6½ inches stroke, develops 800 b.h.p. at 2.500 r.p.m., and weighs, complete, 680 lbs., or 0.85 lbs. per b.h.p. It is therefore by far the lightest successful aero-engine that has yet been produced—particularly when it is remembered that there is no additional cooling weight to be added to the bare engine.

THE BEARDMORE INFLEXIBLE.

The Beardmore Inflexible—an enormous all-metal monoplane now at the Aircraft and Armament Experimental Establishment of the R.A.F., at Martlesham Heath—has now ceased to be a secret and in consequence is attracting a large amount of interest in the daily Press.

As has already been mentioned in The Aeroplane the Inflexible is a monoplane of a design originated by Dr. Rohrbach and amended by William Beardmore and Co., which has been built at the Beardmore Works at Dalmair.

It is fitted with three Rolls-Royce Condor engines of 650 h.p each, and in accordance with the well-known ideas of Dr. Rohrbach the machine is characterised by a very high wing-loading, and a form of construction which approaches that used in ship-building practice.

This particular machine is to be regarded purely as an experiment. It is so far outside the range of present experience in design as regards actual dimensions, that it has been necessary to take no risks that could be avoided in the matter of strength. Consequently the machine is very heavy and can carry little useful load.

But purely as an experiment it may be hoped that it will provide much useful data for future designers of really large aeroplanes.

SIR ALAN COBHAM'S PROGRESS.

On Jan. 27 Sir Alan Cobham, on the Short Singapore flying-boat (two Rolls-Royce Condor engines), left Abukir Bay at 10.15 hours and flew down the Nile to Luxor, a distance of 390 miles, in about six hours. Most of Saturday was spent by the crew exploring the Valley of the Kings.

On Jan. 29 he left Luxor at 07.35 hours and reached Wadi Halfa at 11.20 hours.

On Jan. 30 he flew from Wadi Halfa to Khartum.

COLONEL LINDBERGH'S TOUR.

On Jan. 26 Colonel Charles Lindbergh, who is making a "Good-will Tour" of Central and Northern South America on the Ryan Monoplane "Spirit of St. Louis" flew from Colon, Panama, to Cartagena, Colombia. Offices and shops in Cartagena were closed at noon and a public holiday was declared.

On Jan. 27 he flew to Bogotá, Colombia, where he has been elaborately entertained.

THE FIRST PORTUGUESE MOTH.

Mr. C. E. Bleck, whose acquisition of a De Havilland Moth for use in Portugal was mentioned in The Aeroplane of Dec. 28, left Stag Lane for Lisbon on Wednesday, Jan. 25. He called at Croydon for Customs clearance, and landed safely at Paris shortly after 14.00 hours on that same day.

The De Havilland firm have since received a cable from Mr. Bleck, dated Lisbon Jan. 30, which reads :—

"Arrived safely. Last hop Biarritz—Tancos in 4 hour 50 minutes, average 100 m.p.h. Congratulations on you wonderful machine. Writing.—Bleck."

Mr. Bleck was accompanied on his flight by Mr. Birkett, o Air Taxis Ltd., on another Moth, and from Air Taxis it i gathered that after leaving Paris stops were made a Bordeaux (Jan. 26) and Biarritz (Jan. 27 or 28), but tha accurate information is not yet available.

Mr. Bleck is the first holder of a Portuguese Civil pilot' licence, having learnt to fly at the Portuguese Military Fly ing School at Cintra, and he has already done a good dea of flying in Portugal.

The Moth which he has just taken to Portugal is the firs civil aircraft to bear Portuguese registration.

A CANADIAN LIGHT AEROPLANE.

Canadian Vickers Ltd., of Montreal, P.Q., is reported t be developing a two-seat light aeroplane to be fitted with a A.D.C. Cirrus II engine. It will be of all-metal constructio and will be fitted with interchangeable wheels, floats an skis. It is estimated that it will have a maximum speed o 100 m.p.h. and a cruising speed of 75-80 m.p.h. Its tota weight will be 1,350 lbs. and its service ceiling is estimate to be 14,000 ft.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec. : H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Jan. 29.

Flying Time 4 hr. 50 min. *Instruction.—With Mr. St. Barbe*—E. M Alexander, Miss Wilson, J. G. Maitland-Edwards. *With Mr. F. G. M Sparks*—Miss O'Brien, G. W. Hall. *Soloists.*—A. R. Ogston, D. H. P Esler, R. Sanders Clark, A. F. Wallace, C. E. Murrell.

Notes.—Flying was only possible on one day during the past week

Members Meeting.—In order to give the members an opportunit of meeting the Committee and discussing with them the future polic of the Club, it has been decided to hold a Meeting of the Members o the Club on Wednesday, Feb. 15, 1928, at 6 p.m., at 7. Albemarl Street, London, W.1, by kind permission of the Royal Aeronautica Society.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Jan. 28.

Flying Time 4 hr. 50 min. *Instruction* 2 hr. 30 min. *Soloists* 2 hr 10 min. *Tests* 10 min. *Instruction.—With Mr. Brown*—Messrs. Hall Benson, Brooking, Davison, Goss, Crosthwaite, Stern, and Miss Baerlein *Soloists (under instruction).*—Messrs. Ruddy and Browning. *Pilots.*— Messrs. Meads, Crosthwaite, Michelson, Twemlow and Davison.

Notes.—On Saturday Messrs. Brown, Dobson and Goodfellow pushe off on three beautiful new Avians for the Liverpool Club's opening da at Hooton Park. As the old song has it :—

"Three pilots went sailing out into the West,
Out into the West as the rain came down;"

After an extensive survey of West Cheshire they reached Hooto in safety and spent the day in carting prospective members of th new club around the atmosphere. As a flying meeting, the afternoo was rather spoiled by the weather, but the "pleasant social evening' which followed at the local hostelry was not affected thereby an we render most hearty thanks to our hosts for their hospitality.

[According to *The Manchester Guardian* of Jan. 31 Mr. Howard Pixton who was the first pilot to win the Schneider Trophy for Great Britain has joined the staff of the Lancashire Aero Club and will start wor early in February.]

The Newcastle-upon-Tyne Aero Club.

[Sec. : A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Jan. 29.

Flying Time 7 hr. 50 min. *Instruction* 5 hr. 25 min. *"A" Pilot* 45 min. *Tests* 55 min. *Passenger* 45 min. *Instruction.—With Mr Parkinson*—Miss Klyver, Miss Rambaut, Dr. Alderson, Messrs V. Heaton, Runciman, Griffiths, Horn. *"A" Pilots.*—Mrs. Heslo Mr. Mathews, Mr. Wilson. *Passenger.*—Mr. M. G. Thirlwell with Mr Parkinson from Sherburn. In addition to the above 30 mins.' flyin was carried out on the "Grasshopper" by Miss Leathart under in struction with Mr. Parkinson. Also 30 min. on Mr. Robertson's Avr under instruction by Mr. Parkinson with Mr. Robertson and Mr. A Bell. Mr. Robertson carried out his first solo on this machine.

Notes.—Exceedingly bad weather was experienced throughout th week with the exception of Friday. Sunday was particularly bad, th district being enveloped in fog down to the ground.

On Sunday, Jan. 22, at about 15.00 hours, one of this Club's machine sustained damage to one rear spar of a lower main plane.

The plane was despatched to the De Havilland Company on Monda evening and presumably received by them in time to begin wor some time on Wednesday.

The necessary repairs, which, of course, included recovering an doping, were made and the plane received by the Club on Saturda morning, Jan. 28, enabling it to be fitted to the machine in time t be flying on Sunday, Jan. 29, had the weather been satisfactory.

The plane was, therefore, away from the Club, 300 miles from th works, for only five days.

The Club fully appreciates this excellent service.

The Yorkshire Aeroplane Club.

[Sec. : Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, Yorks.

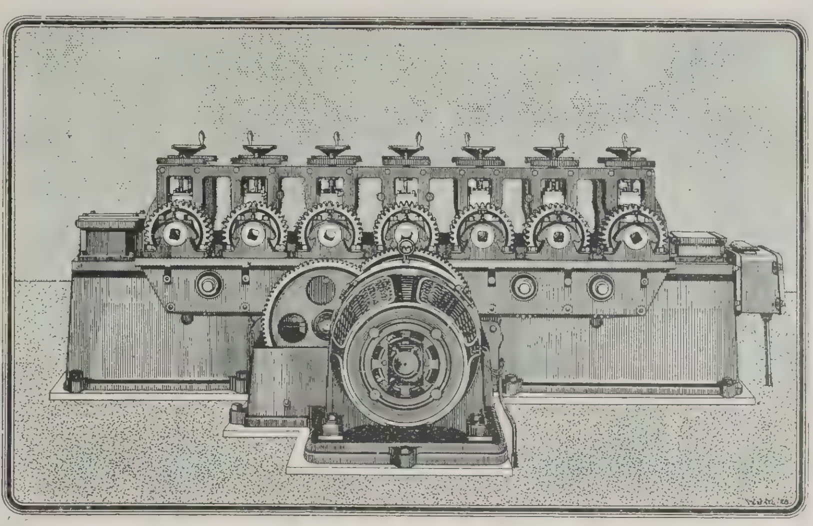
Report for week ending Jan. 28.

Flying Time 13 hr. 20 min. *Instruction* 5 hr. 15 min. *Soloists* 7 hr 15 min. *Passengers* 50 min. *Instruction.—With Mr. Beck*—Dr. Ling Messrs. Balfour, Senior, Yeomans, Hall, Watson, Humpheries, Hep worth, Wall, Jackson, Shires, H. Crowther, A. Crowther, Ostler, Ely

ROCESSES IN THE
ANUFACTURE OF

"Bristol"

IETAL
IRCRAFT



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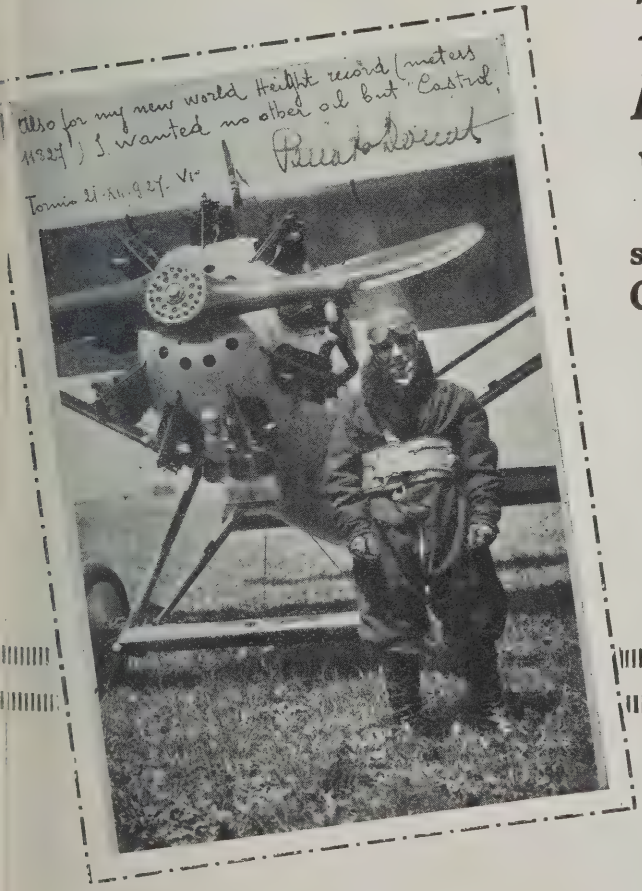
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It will be remembered that Sig. Donati reached a height of 11,827 metres on his Bristol "Jupiter" engined biplane on Dec. 22nd, thus beating World's Record by 682 metres.

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Brackenbury. *Soloists.*—Messrs. Ellison, Humpheries, Brown, Lister. *"A" Pilots.*—Messrs. I. Thomson, Ely, Brackenbury. *Passengers.—With Mr. Beck*—Mrs. Brackenbury, Messrs. Taylor, Kay, Rhodes. *With Mr. I. Thomson*—Mr. Humpheries.

Notes.—Beyond a slight improvement in the weather we have nothing eventful to report this week. A Service 9a and Dick Atcherley on Lady Heath's S.E.5a were our only visitors.

A word in favour of our aerodrome. In spite of the adjacent districts suffering from the worst floods in the country, and despite the entire surface being covered with water, the ground has remained hard and usable the whole time. For preference the South side should be used while these conditions prevail.

This week's funny story: Mr. Beck is giving a short address on Aviation at Leeds and Doncaster during the ensuing week!

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth, Birmingham.]

Report for week ending Jan. 28.

Total Flying Time 6 hr. *Dual.—With Mr. McDonough*—Messrs. F. Scott, J. Baker, E. Lane, E. Wynn, R. Brinton, R. Darlington, and H. Lattey. *Soloists.*—Messrs. E. J. Brighton, R. Jackson, S. H. Smith and S. R. King.

Heavy rains and gales experienced during the week making flying only possible on two days.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwich.]

Report for week ending Jan. 29.

Flying Time 9 hr. 50 min. *Instruction.—With Mr Lines*—Messrs. W. Jewson, A. Cooper, R. Potter, N. Brett, N. Lindley, H. Mack, and G. Surtees. *Soloists.*—Messrs. H. Pank, F. Gough, W. P. Cubitt, R. Harmer. *Passengers.*—Messrs. R. Moore, Capt. Palmer, H. Green.

Notes.—Every use was made of the rare fine intervals during the week and quite a lot of flying was accomplished.

On Saturday Mr. Gough, who has recently taken over the Hon. Managership of the Club, flew to Hadleigh, the headquarters of the Suffolk Club, on important inter-Club business. The weather was beautiful until the return journey was begun, when a heavy rain set in, observation becoming extremely bad. Sunday being reasonably fine many members presented themselves at the Aerodrome, where they were so keen to try the upper air that both Avro and Moth were kept busy until dusk. After flying was over for the day they adjourned to the cheery Club house for tea and one paying a visit there gained the impression of dropping in on a jolly family party.

It is pleasing to note that many new members have enrolled during the week and applications are being received in good numbers.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Jan. 29.

Flying Time 5 hr. 5 min. *Instruction.—With Mr. Lowdell*—Miss G. Rhodes, Messrs. R. Brown, H. Billington, S. Schofield. *Passengers.—With Mr. Lowdell*—Mr. C. Hanson, Mr. Linfield. *Soloists.*—Dr. Jas. Sleigh, Mr. S. Schofield, Mr. C. N. Prentice.

Notes.—Mr. Schofield successfully passed his tests for his "A" Licence on Sunday after waiting many weeks for fine weather.

On Saturday Mr. Gough of the Norfolk and Norwich Club with a passenger paid us a visit, flying Moth G-EBQX.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Jan. 28.

Flying Time 12 hr. 50 min. *Instruction* 4 hr. 40 min. *Soloists* 7 hr. 25 min. *Passengers* 45 min. *Passengers.—With Mr. Bartlett*—Miss Francis. *With Mr. Tratman*—Miss Bernard. *With Mr. Jopp*—Mr. Berland. *Soloists.*—Mr. Roberts, Mr. Tratman, Mr. Downes-Shaw, Mr. Jopp, Mr. Brewer, Mr. Parkhouse. *Under Instruction.*—Mr. Arnold, Mr. Roberts, Mr. Bryan, Mr. T. H. Clarke, Mr. Parkhouse, Mr. Tanner, Mr. H. F. Tiarks.

Notes.—Sunday, Jan. 22, was the best day this Winter, and we got in 10 hr. 45 min. flying on that day alone. The only other day on which flying was possible was Friday, when the wind dropped for a short time. The rest of the week has been a succession of strong Westerly gales and heavy rains.

The Liverpool and District Flying Club.

On Jan. 26, at a public meeting held in the Liverpool Town Hall under the presidency of Mr. F. J. Marquis, it was decided to form the Liverpool and District Flying Club.

Sir Charles Nall-Cain wrote repeating his offer to provide an aeroplane for the club, and it was announced that, through Mr. George Allan, the club had received an offer of a Blackburn Bluebird aeroplane. Seventy applications for admission to the club have so far been received.

SIR SEFTON BRANCKER, Director of Civil Aviation, said 13 light aeroplane clubs were receiving financial help from the Government, but the limited sum of money available was committed up to the hilt, and there was none left for Liverpool. Treasury policy was not to continue to subsidise this sporting effort beyond the three years which the present grants would run. What they hoped when they started those clubs was that wealthy, patriotic, and influential people would take a certain amount of the financial burden upon themselves. At present it was hopeless to ask the Treasury for money, but there were possibilities of assistance in other ways, and they could count on the Air Ministry being at their service.

MR HUGH LEWIS, proposing the formation of a flying club, said that sooner or later this would grow into the larger project of an air-port for Merseyside.

SIR ARNOLD RUSHTON seconded, and the resolution was carried and a committee elected with Sir C. F. Bowring as president of the club, Lord Sefton and Lady Bailey as vice-presidents, and Mr. Frank Davison, a Liverpool member of the Lancashire Air Club, as secretary *pro tem.*

On Saturday, Jan. 28, an informal flying display was held at Hooton Park aerodrome. Mr. T. Neville Stack flew up from Croydon on the A.D.C. D.H. Moth and various pilots flew over from the Lancashire Club and assisted in carrying a large number of passengers.

The Cinque Ports Flying Club.

[Hon. Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

From Mar. 28 to Apr. 4 this Club will hold an Exhibition of Light Aeroplanes in the Folkestone Drill Hall. It is hoped that four different types of machines will be on view and the public will be charged 6d. per head admission. The Exhibition will be open each day (including Sunday) from 14.00 hours to 21.00 hours. On the last night of the show a large public meeting will be held in the Hall in aid of the Club.

On Sunday, Apr. 7, all machines exhibited will be demonstrated at Lympne aerodrome.

The Cape Town Flying Club.

On Nov. 23 the Cape Town Flying Club held an "At Home" at Wynberg aerodrome, the principal event of the afternoon being the acceptance by H.E. the Governor-General as President of the Aero Club of South Africa of the Avro Avian presented by the Shell Company of South Africa to the Aero Club of South Africa. The Avian was subsequently handed over to the Cape Town Flying Club for temporary use and Col. W. D. Beattie in accepting it on behalf of the club said that the machine would be used to spread the knowledge of flying locally and to prove its usefulness to the country.

The Avian was loaned to the Cape Town Club on condition that it would visit all the South African Flying Clubs and give demonstrations, thus giving each club a share of the gift. After visiting all the various centres the Cape Town Club is to be given the first option of buying out the "shares" of the other clubs.

Col. G. L. P. Henderson, who has recently arrived in South Africa, assisted in the task of carrying a large number of passengers on a D.H. Moth loaned by Major Miller.

The Canadian Flying Clubs.

Under the scheme for the formation of Government-assisted Flying Clubs, the Department of National Defence has received authority for the formation of five clubs and sanction is being requested for the establishment of ten more in the new estimates.

Ten D.H. Moths have been ordered, several of which have already been delivered.

The Montreal Light Aeroplane Club has been incorporated and has already reached its quota of 150 flying members. It will use the St. Hubert aerodrome on the south side of the St. Lawrence which is being built by the Canadian Government as the Canadian airship base. This aerodrome will be developed into a big public air terminal.

Other clubs are being established at Toronto, Edmonton, Quebec and Vancouver.

It is reported that Sir Charles Wakefield has presented a D.H. Moth to the Toronto Aero Club.

Early in 1928 the Air Force Club of British Columbia is to be merged into the Aero Club of British Columbia, Vancouver Branch and the new organisation will accept two D.H. Moths from the Canadian Government for the operation of a Flying Club.

"Histories Make Men Wise."—*(Francis Bacon.)*

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Maurice Baring. 8/6

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H. A. Jones. 10/6

THE HISTORY OF 60 SQUADRON, R.A.F.
A. J. L. Scott. 15/-

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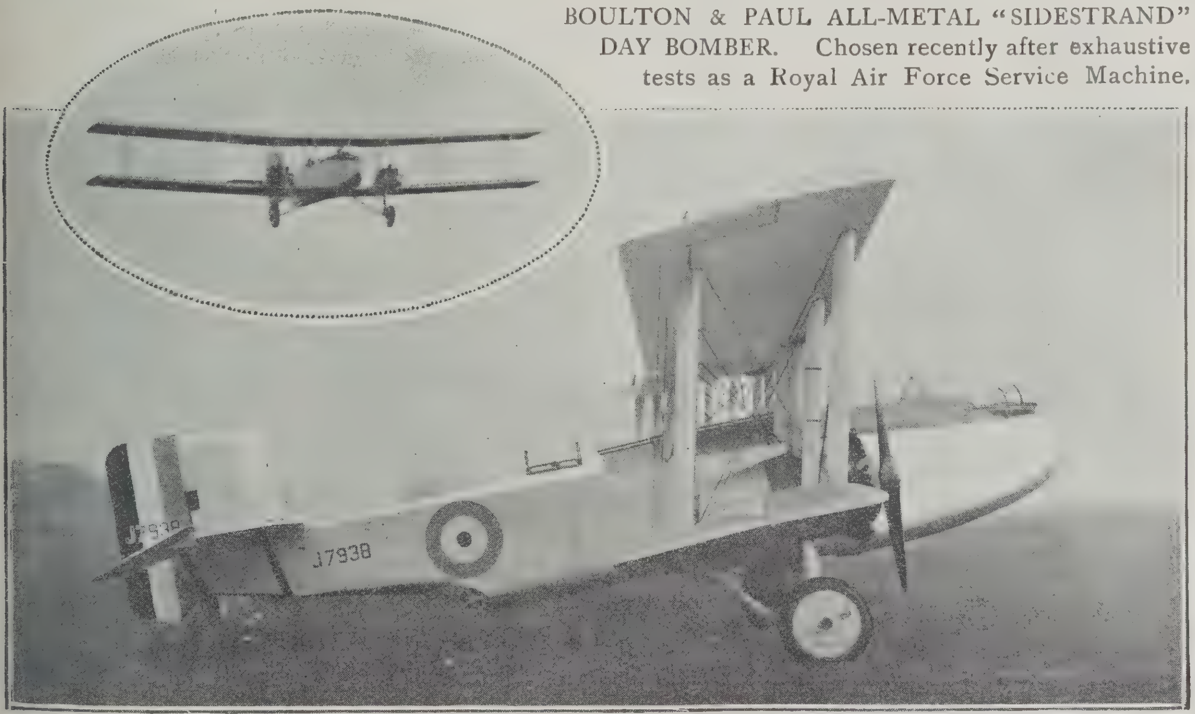

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 16; Tuesday, 6; Wednesday, 20; Thursday, 16; Friday, 18; Saturday, 15; Sunday, 4.

Imperial Airways Ltd. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 34, passengers 191, freight 12 tons.
Air Union :
Paris—London : Machines 22, passengers 59, freight 10½ tons.
K.L.M. :
Amsterdam—Rotterdam—London : Machines 14, passengers 41, freight 3½ tons.
Sabena :
Brussels—London : Machines 11, passengers 9, freight 1¼ tons.
Deutsche Lufthansa AG. :
Amsterdam—London : Machines 12, passengers 14.
Private :
Machines 2, passengers 0.

Total number of trips by British Machines, 35, carrying 191 passengers. Foreign Machines, 60, carrying 123 passengers.

COMPARATIVE FIGURES.

Week ending Jan. 29 :
Machines, 95; Passengers, 314; Crews, 174; Total personnel, 488.
Corresponding week, 1927 :
Machines, 53; Passengers, 122; Crews, 87; Total personnel, 209.
Corresponding week, 1926 :
Machines, 58; Passengers 119; Crews, 74; Total personnel, 193.
Corresponding week, 1925 :
Machines, 47; Passengers, 97; Crews, 62; Total personnel, 159.
Corresponding week, 1924 :
Machines, 58; Passengers, 112; Crews, 89; Total personnel, 201.
Corresponding week, 1923 :
Machines, 29; Passengers, 52; Crews, 61; Total personnel, 113.
Corresponding week, 1922 :
Machines, 22; Passengers, 42; Crews, 33; Total personnel, 75.
Corresponding week, 1921 :
Machines, 13; Passengers, 8; Crews, 14; Total personnel, 22.

Croydon Notes.

Croydon during the last week was immersed in preparation for the move to the new buildings, which, as recorded below, occurred punctually on the appointed date, Jan. 30. The only section of the aerodrome organisation that has failed to keep to schedule is not unexpectedly the official traffic control organisation, and the central tower remains in its old position pending further tests of the new wireless gear, the calibration of the direction-finding wireless, and so forth.

Despite the preoccupation of the ground staff with the matter of moving, flying went on as usual. One notably good day's work which deserves notice was done by Herr Bohner, of the Luft Hansa, who left Amsterdam on the Rohrbach Roland D.1280 at 09.35 hrs. on Wednesday, Jan. 25, reached Croydon at 13.22 hrs., turned round and loaded up, left Croydon once more, at 14.14 hrs., and landed at Amsterdam at 16.55 hrs.

Mr. Dudley Travers, who had been flying on the Far East route of Imperial Airways for 14 months without a break, reached England on a well-deserved spell of leave last week, and promptly paid a visit to Croydon, where he was welcomed by many old friends. He seems to have found flying on the Cairo-Basrah route a distinctly more pleasant business than operations in this country, despite his little experience of being lost in the desert.

Among the items still to be moved at Croydon is Imperial Airways engine shop equipment. This now includes an extremely ingenious test-bed for air-cooled radial engines, which has been devised by the engineering staff of Imperial Airways. At the moment it is not permitted to describe this, but it may be said that it cheapens the work of running engine tests to a remarkable degree.

Impressions of the New Airport.

Some eight years ago, when I first joined the staff of The Aeroplane, the Editor told me to look after Croydon Aerodrome and see that it behaved itself. His excuse for giving me the Civil Aviation side of the paper was that I lived fairly near the Aerodrome. As a matter of fact it was a very appropriate method of appointment, as that is the way most civil aviation appointments were made in those days.

I remember at that time discussing Civil Aviation with the Editor and saying to him that in my opinion Civil Aviation in five years' time would see enormous developments. There would be huge 100-seater aeroplanes arriving from all over the world, huge palatial new buildings and hundreds of passengers and tons of goods would be dealt with daily at the aerodrome

The Editor replied that I need not worry over that. He thought that the present hutments would do for another ten years or so and that after ten years aircraft might perhaps carry 20 or 30 passengers apiece, but aerodynamically they would not have altered much. He added sarcastically that they might perhaps be thinking by then of fitting the Handley Page slot. Which was not after all such a very bad look ahead. One puts this on record for the benefit of those who are inclined to scoff at opinions expressed in The Aeroplane.

All of which brings me to the point in question which is that the temporary hutments which since Mar. 30, 1920, have been adequate as the offices and sheds of the Air Port of London were evacuated on Jan. 30 and the new buildings were occupied.

The new buildings are on the Eastern boundary of the aerodrome and are approached by way of Purley Way, which bye-passes Croydon on the Brighton Road from Thornton Heath to Purley.

They consist of five main blocks. On the North is the hotel. Then comes the main block of offices, on top of which is the control tower. South of this are the two big sheds, beyond which are the workshops, etc.

In front of the main offices is a large expanse of concrete which is the actual arrival and departure platform. From this there are various concrete runways by which Aircraft enter and leave sheds.

The main block contains on the ground floor a big glass-domed booking hall, the emi- and immi- gration hall and the Customs inspection room from which passengers pass out on the aerodrome or into which they pass from the aerodrome. There are two separate doors on each side of the hall, for incoming or outgoing traffic.

Ranged round the booking hall are the air transport and agency offices in which the actual booking is done and there is also a refreshment bar, post office and bookstall. There is a gallery around the booking hall where the individual company officials have their own private offices, each official having his office (in theory) immediately over his booking office. From this gallery, a passage runs right round the whole block (which is a hollow square) and on either side of this are offices.

All the offices looking out over the aerodrome are occupied by the C.A.T.O. and Customs officers and staff, with one exception, which is occupied by the aerodrome press representative.

Another staircase leads up to the roof which is flat, and from this roof a splendid view of the whole aerodrome can be had. In due course when civil aviation has grown sufficiently another storey can be added on this flat roof. Hence the control tower is reached by another staircase. When this tower is in complete working order, it is hoped that a description of it, its functions, and its gadgets, will appear in The Aeroplane.

Here one may state that the wireless station which is worked from the control tower by what is known as remote control, is some three miles away by Hackbridge railway station on the Mitcham road. Thus there is no danger of the masts obstructing incoming aircraft, which can thus be brought by direction-finding right over the aerodrome itself. One of the disadvantages of having the station actually on the aerodrome was that when an incoming machine was two or three miles from the aerodrome, direction-finding ceased to function.

Each of the sheds is divided into two compartments, both of which can house ten machines of the size of the Argosy.

Behind No. 1 shed are the offices, workshops, etc., of Imperial Airways. Behind No. 2 shed are the petrol, oil, tyre and pleasure flight companies' offices. Beyond and behind No. 2 shed are the various engine test-shops, workshops and garages.

At the present moment the whole place is still in the hands of working parties and is therefore in an untidy and unfinished condition.

Now that the move has been made the old temporary hutments and the brick sheds are in the hands of a contractor for demolition. This work is being started at once and this and the subsequent levelling is expected to take three months. It seems more likely that this operation will last at least until June.

Meanwhile the new buildings are being finished off and the hotel also is approaching completion. When this is done and when the paths are made and the ornamental borders are finished it is hoped that there will be an official opening by a High Personage in the late spring or early summer.—C. D.

AERODROME OBSTRUCTIONS.

Air Ministry Notice to Airmen No. 7 of 1928 states :—

Bircham Newton.—A landing circle is in course of construction in the centre of the landing area. The obstruction will be marked by red flags by day and red lights at night.

Castle Bromwich.—A landing circle is in course of construction in the centre of the aerodrome. There are a number of deep cart ruts running from the N.W. corner of the aerodrome to the N. of the landing circle which should be avoided. The obstructions are marked by day with red flags and at night with red lamps.

Extract from "The Times," 16-12-27.

FAR EAST FLIGHT AT BOMBAY.

BOMBAY, Dec. 15.—The four R.A.F. Supermarine flying-boats, under the command of Group Captain Cave-Browne-Cave, which left Plymouth on October 17 on a flight to India, Australia, and the Far East, arrived here from Karachi to-day. They covered the 560 miles in seven hours.

Air Vice-Marshal Sir Geoffrey Salmond, A.O.C. Royal Air Force, India, who flew in one of the machines, described the flight as one of the most perfect he had ever made.—*Reuter.*

TOTAL DISTANCE COVERED TO BOMBAY 5,560 MILES. TOTAL MACHINE MILES TO DATE, 22,240 MILES.

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47-45

Eastchurch.—The aerodrome is waterlogged and is only fit for landing near the circle. It is inadvisable for pilots who are not thoroughly acquainted with the aerodrome to attempt to land.

Hawkinge.—The aerodrome is unfit for use until further notice.

Hendon.—The aerodrome is unfit for use, except for light aeroplanes.

Marden.—The landing ground is waterlogged and totally unfit for use.

A PROPOSED REVIVAL OF BRITISH GLIDING.

A letter has been received from Mr. E. de Busby, of Ashville College, Harrogate, announcing his intention of trying to organise a British team to take part in next year's gliding meeting at the Rhön which will be held in August.

Mr. de Busby's proposals are that all those interested in this project should subscribe say £5 to cover preliminary and general expenses, and that when enough subscribers have been collected a machine should be acquired, a gliding site selected, and gliding should start. Any subscriber should be eligible to try his hand at gliding, and from among those found suitable a team of four or five would be selected to go to Germany.

The gliding site will be in the neighbourhood of Harrogate and Mr. de Busby will supervise the gliding training.

Those who are interested in this project are invited to communicate with Mr. de Busby.

THE PROGRESS OF THE AUTOGIRO.

Senor de la Cierva has recently had two minor mishaps on the Autogiro.

When testing at Yate a new model built by George Parnall and Co., driven by an Airdisco engine, he took off before the rotor had attained sufficient speed and the machine turned over and was wrecked.

A few days ago he took the Avro-built Viper model out in a high wind at Hamble in order to gain experience of the craft under bad conditions. Again he took off before the rotor was rotating fast enough and was turned over. The machine was badly damaged and Senor de la Cierva sustained a cut face.

Apart from these mishaps the Autogiro has shown considerable progress. The Avro-built machines have shown themselves to have the performance of standard Avro products with the same engines, and they are said to be easy to handle.

Various experiments have been made with rotors and machines with two-, three-, and four- bladed rotors have been tested

Flt. Lt. G. I. Thomson, who until lately has been chief instructor to the Hampshire Aeroplane Club, has now joined the Autogiro Company as test pilot.—G. D.

PILOTS AND ENGINEERS WANTED.

The Editor of The Aeroplane knows of vacancies for several experienced seaplane and flying-boat pilots, and also for several ground engineers, with a firmly-established and strongly financed firm in one of the British Dominions. Each applicant is asked to communicate in the first place with the Editor of The Aeroplane, and to send a clearly set forth account of his experience, together with a photograph of himself. The way in which these requirements are fulfilled will count largely for or against the applicants in the estimation of the prospective employers.

A HAWKER OCCASION.

On Thursday, Jan. 26, the H. G. Hawker Engineering Co. Ltd., held a Cocktail Dance at Nuttall's Restaurant, Kingston-on-Thames.

This function, populated by the élite, youth and beauty of the Aircraft Industry, like all those held by the Hawker Company, was an unqualified success. Cocktails, although featuring in the title, were but the precursors to an evening of well-organised revelry which lasted from 20.30 hours well into the small hours of the next day.

The organiser, Mr. F. S. Spriggs, who was responsible for everything, including an excellent cabaret and various side-shows, is to be congratulated on the success of the evening, but then nothing organised by anyone connected with the Hawker Company could be anything but a success.

ETHYL-RED THE UNDEADLY.

At a lunch given on Jan. 27 by the Anglo-American Oil Co Ltd., Dr. Kehoe, who has been and is continuing extensive and painless researches in the United States into the effects of Ethyl petrol on health, gave at considerable length the results of these researches.

He pointed out that he was satisfied that there is no danger of poison through contact with ethyl petrol even if the skin is broken.

There is no effect from the exhaust gas, other than from carbon monoxide, which is present in the exhaust already. The only effect on the exhaust from ethyl is the output of a small amount of lead bromide which is harmless. No ill effects are found in the engine after prolonged use with ethyl petrol.

There is a certain amount of danger in the manufacture of Ethyl fluid but not more than in the manufacture of lead paints and the various other lead products.

Altogether Ethyl petrol appears to be a perfectly harmless and innocuous commodity.—G. D.

THE BRISTOL JUPITER ENGINE.

In view of the fact that various statements have been made in the daily Press to the effect that Mr. R. H. Macintosh and Mr. Bert Hinkler suffered engine trouble on their attempted flight to India in November, 1927, on a Fokker F.VII fitted with a Bristol Jupiter engine, the following signed statement which they have sent to the Bristol Aeroplane Co. Ltd. is of interest :—

> We flew for a total period of 24 hours 42 minutes. During the whole of this time our engine never gave us a moment's anxiety.
>
> The weather conditions after the first two hours were abnormally bad, and we were compelled to use full throttle for long periods in our efforts to climb out of the fog and heavy snow clouds.
>
> After making our decision to turn back the engine was flown for a period of eight hours at full throttle.
>
> It is of interest to state that after landing in Poland the machine was left in the open in intense cold weather with snow falling on it for 42 hours, and when ready to take off the engine was started at the second swing.
>
> We are definitely of the opinion that no other aircraft engine has ever been subjected to such bad conditions, and we believe that very few other aircraft engines would have stood up to this gruelling test
>
> (Signed) R. H. Macintosh.
> (Signed) B. Hinkler.

MORTGAGES AND CHARGES.

Commercial Airships Ltd.—Debenture dated Jan. 16, 1928, to secure £1,600, charged on the Co.'s undertaking and property, present and future, including uncalled capital. Holder: W. F. Johnson, 18, Theobalds Road, W.C.

PERSONAL NOTICES.

Death.

FISHER.—On Jan. 30, at Helwan, Egypt, as the result of a flying accident, L-AC. Harold Edwin Fisher, R.A.F.

Marriages.

DEANE—SMITH.—On Jan. 26, at Weyhill, Flt. Lt. W. W. Deane, R.A.F., to Flora Douglas, second daughter of Major and Mrs. J. W. Smith, of Weyhill.

LEE GUINNESS—STRANGMAN.—On Jan. 26, at St. Margaret's, Westminster, Mr. Kenelm Edward Lee Guinness, younger son of the late Mr. Benjamin Guinness and of Lady Henrietta Guinness, to Josephine, younger daughter of Sir Thomas and Lady Strangman, of 3, Buckingham Gate, S.W.

Forthcoming Marriages.

BOOTH—TAYLOR.—A marriage has been arranged, and will take place shortly, between Sq. Ldr. R. S. Booth, A.F.C., R.A.F., younger son of the late the Rev. J. W. W. Booth, of Prestwood, Bucks, and Mrs. Booth, of Banbury Road, Oxford, and Lily, only daughter of Mr. E. J. Taylor, of Fairlight, Luton.

MOON—CRAVEN.—The engagement is announced between Arthur G. Moon, Flg. Off., R.A.F., eldest son of the Rev. C. G. Moon, of Broadwell Hill, Moreton-in-the-Marsh, Glos., and Sheila, younger daughter of Mrs. Gerald Craven, Coln St. Aldwyns, Fairford, Glos.

Births.

HUBERT.—On Jan. 26, at 2, Passage Lenôtre, Le Vésinet, France, the wife of Charles Hubert—twin daughters.

PARRY.—On Jan. 24, 1928, at the White House, Ovington Mews, S.W.3, to Joan, wife of Sq. Ldr. Rey Parry, D.S.O., R.A.F.—a daughter.

WIGGLESWORTH.—On Jan. 28, at 26, Oakwood Court, Kensington, to Peggy (*née* Bemrose), wife of Flt. Lt. C. G. Wigglesworth, A.F.C., R.A.F.—a daughter.

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05 Eng'ng.

THE AEROPLANE—FEB. 8, 1928.

THE MIDDLE COURSE.

THE AEROPLANE
INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

Vol. XXXIV. No. 6. SIXPENCE WEEKLY.
Registered at the G.P.O. as a Newspaper.

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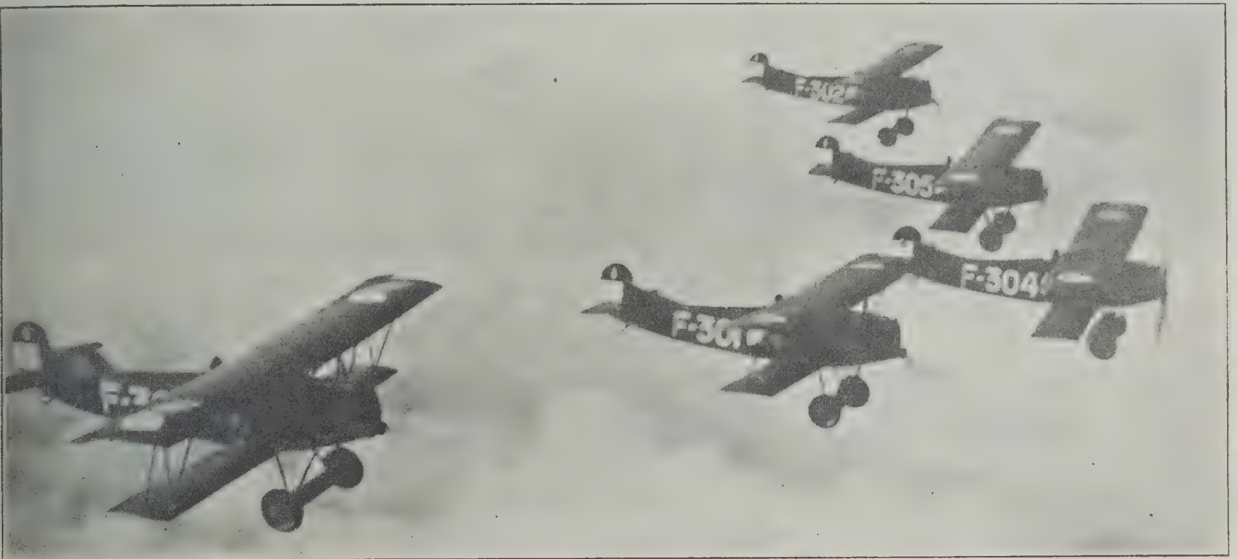
"SWIFT BIRDS OF PASSAGE WING THEIR FLIGHT."
(Longfellow.)



A DEFERRED PASSAGE:—A formation of Fokker DVII single-seat fighters belonging to the Dutch Colonial Army Flying Service in the East Indies. These machines are identical to those used by the German Army in 1917-18, and the type is still in use by the Dutch Army and Naval Air Services in Holland and the East Indies.

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FEB. 8, 1928.

THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 6.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON THE SAFETY OF THE MIDDLE COURSE.

ompetition is good for trade. Open confession is good the soul. Argument increaseth understanding. And *medio tutissimus ibis.* Therefore one hopes that British ation, and the British Aircraft Industry, may be benefited enlightened by the opinions and arguments set forth he letter from Mr. C. R. Fairey and one's replies thereto ch follow hereafter.

obody is better qualified to controvert a critic than is Fairey. A critic is generally regarded as "one who ws how but can't." Mr. Fairey has shown that he ws how and can, for he stands out as a success among successful men of all the World's aircraft industries.

the sense that he has built up an enormous industrial cern entirely by his own efforts, he is a self-made man. he is distinctly not a self-made man of that type whom a witty Scot once remarked that he had relieved Almighty of an awful responsibility. Mr. Fairey has le his position in the World not by mere ability to sell gs or to make things which people want, but rather by ability as an engineer, his foresight in seeing what ld be needed and his talent in diplomacy and in finance. is to the ordinary successful business man what a states- is to a politician.

r. Fairey is peculiarly fitted to discuss our position in tion to American aircraft because he is too big a man eel prejudice on purely national grounds. In 1923, when Curtiss Company had produced the wonderful racing hines which not only won the Schneider Trophy on ts but put up the World's Speed Records on wheels, and equipped the U.S. Army Air Service with pursuit-ships which were something like fifty miles an hour faster than anything in Europe, Mr. Fairey went to America and entered into a business alliance with the Curtiss Company.

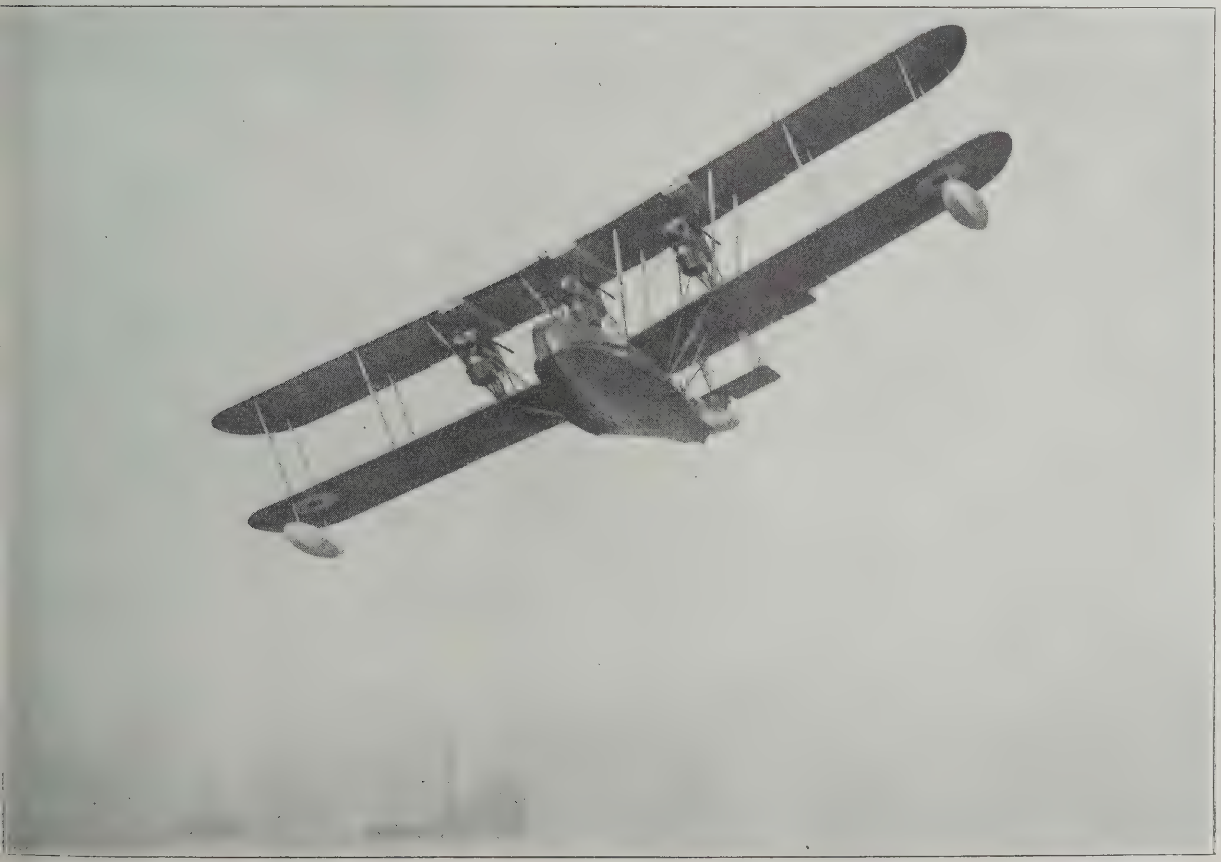
This resulted in the production in this country of the Fairey Fox which on sheer performance was years ahead of anything else on this side of the Atlantic. And he imported the Curtiss D.12 engine which, in spite of political agitation against the expenditure of British money on American war material, has acted as a spur and has again put us ahead in the production of certain types of Service aircraft.

Therefore when Mr. Fairey criticises the editorial opinions expressed in THE AEROPLANE nobody can regard him as being insular or narrow-minded or prejudiced. Here, then, are his criticisms of THE AEROPLANE'S criticisms of the British Aircraft Industry :—

MR. FAIREY'S VIEWS.

Sir,—THE AEROPLANE has made much lately of the question of the American boom in Civil Aviation and the danger it represents to our markets abroad, both existing and potential, and the evergreen suggestion that the British manufacturer is so lacking in enterprise that only under the stimulus of violent press criticism is he likely to work out his own salvation. So it may interest some of your readers to hear a manufacturer's view on the particular points at issue.

The one thing the British Aircraft Manufacturer has never lacked is unrestricted and incompletely informed criticism, and to attack him as incapable of initiative and



EAST OF SUEZ.—The Blackburn Iris (three 650 h.p. Rolls-Royce Condor engines). Three machines of this type are under construction and it is believed that they will be used for patrol work in the Red Sea.

unenterprising is a stereotyped diversion of his critics which evokes most gleeful response among a certain type of people abroad, not least in Australia and America, where the general idea of the ineptitude of the British manufacturer is a traditional belief, not unaccompanied, of course, with a complacent conviction that the critics themselves could do much better.

The main issue of The Aeroplane's attack is that all the Industry really has to do is to make an imitation American monoplane, fit it with a Wright Whirlwind 200 h.p. engine and proceed to capture the World's Market with it in competition with its American prototype, although what benefit this would be to the British Engine Manufacturer is not made clear.

However much the British manufacturer may be in need of showing enterprise it is to be hoped he will not adopt this particular line.

The American monoplanes in question have their points but they fall short of the present British standard of workmanship and material, and the Wright Whirlwind Engine, excellent as it is, is not sold with the 30-mile following wind which it exploited so successfully in the Trans-Atlantic flights last summer,—which flights have been responsible for its world-wide advertisement.

It is true that there is a tremendous burst of activity in Civil Aviation in America and the sales of small Civil aircraft are going up by leaps and bounds. They use, however, mostly the Curtiss OX engine and the following points are not usually brought out.

America has now, I believe, between 700 and 800 airports, these being for the greater part supplied by the Municipalities concerned.

It has vast tracts of country excellently adapted for flying, with poor communications otherwise and with a wealthy population able to afford air transport.

Nothing of the kind is to be expected in this country on the score of climate alone, and when one considers the excellent rail and road communications of these islands, the lack of aerodromes, the high cost of land adjacent to any of the large towns, and the restrictions under which private flying has in the past been bound up, then the British output figures for this class of machine compare very favourably with the American, and the export figures probably exceed them.

Another very important point has been overlooked in this criticism. These American light aircraft are no built by the large aircraft firms who are Government contractors, in fact the difference is extraordinarily marked the fact being that these firms have to maintain standard of workmanship and overhead charges owing to the usua complications and fluctuating demands associated wit Government business that render the making of ligh commercial aircraft utterly impracticable.

I believe I am correct in saying that no big America firms who are Government contractors make or deal i small civil aircraft, and none of the makers of thi latter class of machine are Government contractors—eac type in itself is a separate industry.

Exactly the same reasoning applies to the British manufacturer. The British Industry has been nurtured by th Government with the definite object of arming the Services and providing the necessary means for rapid expansion and high production in the event of a nationa emergency. It has been encouraged to produce highl efficient machines of very robust construction, not onl to give maximum performance but to supply the multitudinous demands of the various branches of the Roya Air Force, and I suggest that it has been successful.

It is not equipped for, and by its very nature is no likely to be able to compete in, the light aeroplan industry in the commercial field at competitive prices.

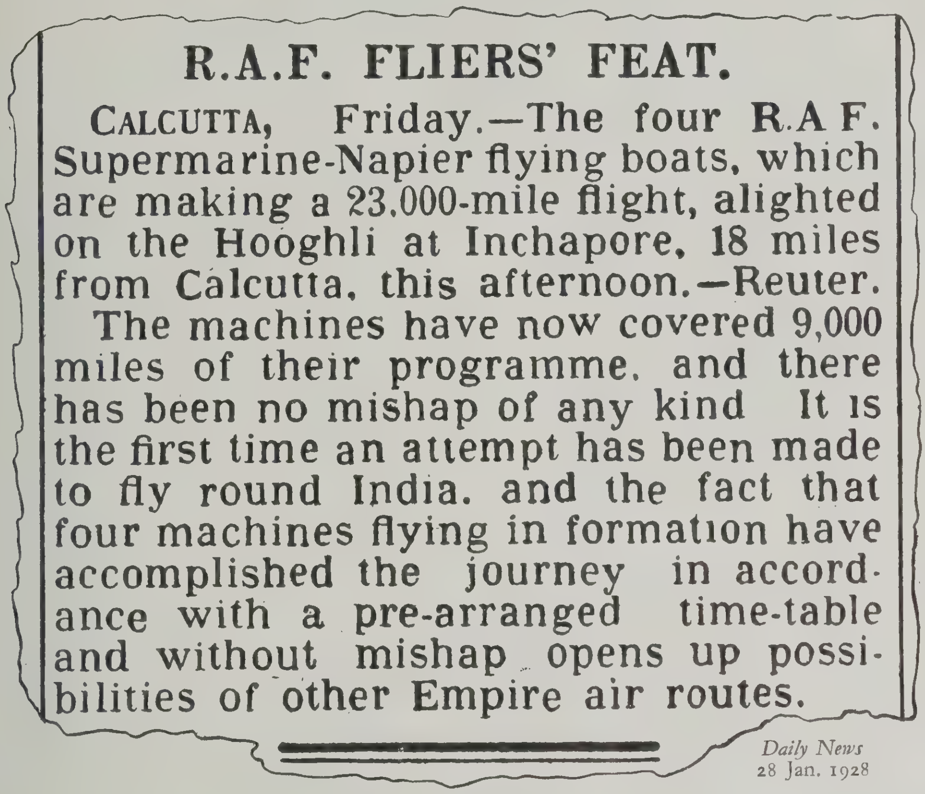
On the other hand it does a larger export trade tha America in military types and given that the necessar money were forthcoming could re-arm the Air Forc entirely with aircraft of every type which have not thei equal in the world.

Anyone with an inside knowledge of the complicate resources that are necessary to the development of modern service aircraft would realise how absolutely unfitted a firm devoted to that end would be to compete i the commercial field for cheap machines.

In conclusion I would suggest that uninformed criticis of the British manufacturer is not of any great assistanc to either foreign or Empire trade. It is eagerly seize upon by his competitors, and others, and does injury t the country as a whole. Shibboleths about Englishme never taking action until they are kicked and so on ma justify the critic's own conscience but do not represen the facts.

I suggest that the extraordinary recovery of this country

ADVANCING.—The new headquarters, works and aerodrome of the Larkin Aircraft Supply Co. Ltd. at Melbourne which were opened by H.E. the Governor-General of Victoria on Oct. 20, 1927. The water in the foreground is a dead-end of a tributary of the Yarra.



R.A.F. FLIERS' FEAT.

CALCUTTA, Friday.—The four R.A.F. Supermarine-Napier flying boats, which are making a 23,000-mile flight, alighted on the Hooghli at Inchapore, 18 miles from Calcutta, this afternoon.—Reuter.

The machines have now covered 9,000 miles of their programme, and there has been no mishap of any kind It is the first time an attempt has been made to fly round India, and the fact that four machines flying in formation have accomplished the journey in accordance with a pre-arranged time-table and without mishap opens up possibilities of other Empire air routes.

Daily News
28 Jan. 1928

The Supermarine-Napier flying boat is fitted with two 450-h.p. Napier aero engines. 72,000 engine miles therefore have been covered without mishap.

That these four machines have flown together according to a pre-arranged programme emphasizes the wonderful consistent reliability of the Napier.

Other Napier Achievements.

Schneider Trophy, 1927. *Winner, Supermarine-Napier with Napier engine. Average speed,* 281·669 *m.p.h.*

Cape to Cairo and back. Twice flown by 4 *Fairey machines, each fitted with a Napier engine*—100,000 *engine miles.*

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which fought and paid for the larger part of the Great War, which pays its international debts in full, which brings the pound sterling above par, and at the moment employs more people, despite official figures, than have ever been employed in these islands before, is an effort not to be ashamed of.

The standard of living is rising and there is distinct hope of a general increase of the prosperity of the nation. I suggest that this has been the work not of the politicians or even the press of the country but of that much-despised person the British industrialist of which the British Aircraft Industry is only a humble unit.

I would further suggest that his much-vaunted American or German competitor, who found himself in the cleft stick of our high taxation and labour union restrictions might not have acquitted himself so well.

(Signed) C. R. Fairey.

A Critic's Explanation.

Before starting on the entertaining task of arguing with Mr. Fairey perhaps one may be forgiven for a purely personal explanation of one's own qualifications as a critic. The average newspaper critic as a rule has been a newspaper man all his life, and has had no practical experience of the things about which he writes. One can at any rate defend oneself against such a charge on the grounds that only by accident one took to writing at or about the age of thirty-five.

In the previous seventeen years one had been in turn a student of engineering, a draughtsman in a cycle factory, a works manager's assistant in about the first factory in Birmingham to be equipped with batteries of automatic tools, a general manager of a very small factory, a commercial traveller for a very big one, an area manager for one of the most important mechanical patents in the World (which brought one in contact with a number of great manufacturers and impressed one with their intense stupidity), and an advertisement canvasser for a cycle and motor trade paper (which brought one still more closely in touch with the density of English manufacturers from another angle). And so finally one descended into journalism.

One can at any rate claim to know more than most newspaper men about British manufacturers from the various points of view of the manufacturer, the advertiser, the salesman and the consumer.

Consequently when one remembers the lamentable histories of the Cycle Trade and the Motor Trade and sees their course threatening almost inevitably to repeat itself in the Aircraft Trade one does one's best to point out the history of the past to aircraft manufacturers, some of whom are still so young that they have had no experience of any trade other than the aircraft trade, except perhaps when serving their time in engineering shops.

A Young Industry.

The Aircraft Industry as a whole suffers from having risen to National importance and financial stability during the War when no business experience was needed to make money. All that was wanted in those days was good solid ability as a production engineer, though some aircraft constructors who had a natural gift for finance made more money than others, and kept it through the after-war slump.

It is true that the firms which now survive in the Aircraft Industry have done so by virtue of the ability of their designers as well as of their managers. And it is also true that in a good many firms the most able designer of the lot is the very man who is the head of the firm. But the chiefs of the majority of our aircraft firms had not before the War 1914-18 had experience of buying and selling in the World's markets against foreign competition.

That is why immediately after the Armistice so many firms embarked on wonderful schemes to do business abroad and so often engaged as their representatives abroad men who were utterly unsuited for the job.

At that time our firms were faced with the difficulty that the French and Italian Governments were practically giving away obsolete war machines in quantities whereas our manufacturers were trying to sell up-to-date aircraft at prices which would show them a profit.

But for the fact that the Aircraft Disposal Co. Ltd. was able to offer foreign buyers thoroughly good re-conditioned British aircraft at very much reduced prices (though even these were twice or three times those of Continental competitors), we should scarcely have sold an aeroplane abroad during the first few years after the War. But the A.D.C. did at any rate demonstrate that even a war-time mass-producation British aeroplane was better than the best of its European competitors,—so we were that much to the good.

The Beginning of Foreign Trade.

Thereafter came a period when, thanks to the excellen of our newer war machines, quite a number of British ai craft constructors were able to sell machines to foreig nations at prices sometimes three or four times that whi the same nations would have had to pay for the mo modern Continental machines,—and this despite the fa that our manufacturers were only allowed to sell machines types which were already old-fashioned in the Royal A Force.

During the last two or three years our manufacturers ha been partly relieved of this handicap and have been allow to sell machines which are still comparatively new in th R.A.F. But, as mentioned last week, we are still not allow free trade in the export of war-machines.

The result is that, as Mr. Fairey says, we produce high efficient war-machines of very robust construction which gi maximum performance and satisfy the multitudinous d mands of the R.A.F.,—the demands of the R.A.F. being r garded by foreign nations as the utmost that any Air Se vice in the World can ask.

In other words, we have established throughout the Worl a reputation for producing aircraft of the highest possib grade in every way. But until a year or so ago our e ports consisted entirely of these high grade war machine

More recently, thanks primarily to the enterprise of th de Havilland Co., we have made for British aircraft a equally high reputation at the extreme other end of th scale. All over the World the de Havilland Moth, th Avro Avian, the Blackburn Bluebird and the Westlan Widgeon are regarded as the last word in small aeroplane They are as carefully and as robustly built as the best o our war machines and necessarily their price is high. Bu thanks to their reputation people abroad will pay the pric for them.

A Policy of Extremes.

In other words our position among the World's aircraft ha become exactly what it has been, and, apparently still i among the World's automobiles.

At the one end of the scale we have had the Rolls-Royc and certain other extremely well-built high-priced car At the other end of the scale we have had a number o small beautifully built and also high-priced very small car But what we have not had in the motor trade has been th medium-powered cheaply-built but robust, reliable and well equipped middle-class automobiles with which the America trade has captured the World's motor trade.

Be it remembered furthermore that these essentiall middle-class American automobiles have not only capture the trade of foreign nations and of the British Dominion Overseas, but they have also captured a very big share o the British trade which our own motor-makers might hav had if they had laid themselves out to produce that clas of car.

Even the Aircraft Industry itself bears witness to thi lamentable fact. If one goes to any gathering at whic the important people of the Aircraft Industry are met to gether one sees the sorrowful sight of an altogether undu proportion of the better-class American cars among a few very high-class British cars and a number of little Britis cars.

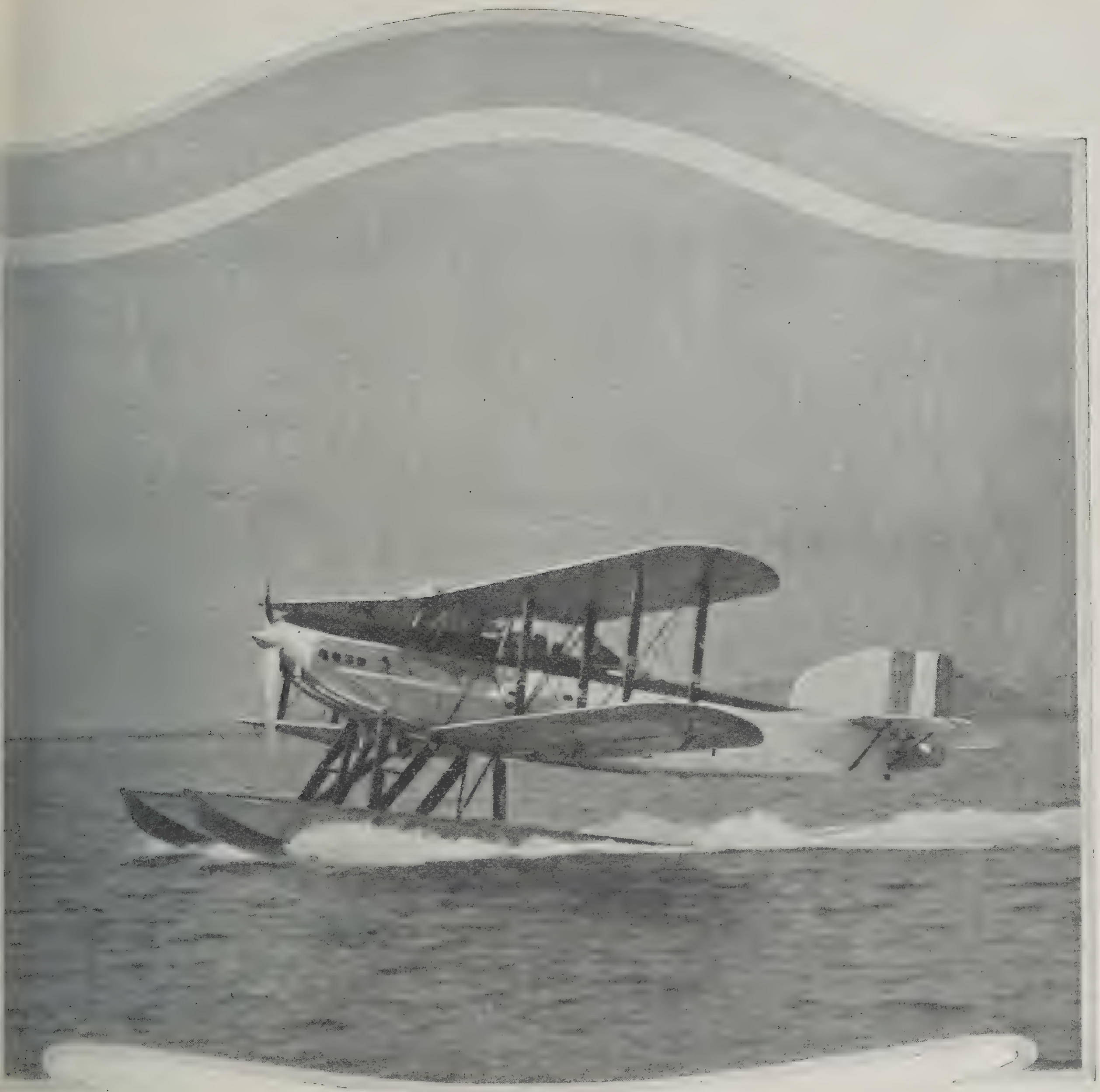
In fact some of our leading aircraft manufacturers have declaimed emphatically that they use American cars because there is no English car which can give them the same performance, and the same adequate equipment of instruments and gadgets, at anything like the price of an American car, and that they do not intend to use an English car, even though they can afford it, till some English moto manufacturer will give them equally good value for thei money.

And here one is completely in sympathy with them. What English car *at the price* can put up the performance, give the comfort, and show the equipment of a Chrysler, a Buick a Packard, or an Essex? Why then pay the same price fo an English car which, though perhaps better made, is smaller, less comfortable, and on a long journey a lot slower?

Thus it may be seen that the American automobile manufacturer has captured the World's market and a large portion of the English market by sticking to that safe middle course which by making a middle-class car gives service and value for money instead of taking to our own policy of extreme refinement, high power and high cost of production at one end of the scale, with low power and small size, even if with high refinement, at considerable cost at the other end.

Now one holds that here is an exact parallel to the situation in which the Aircraft Industry is going to find itself unless it also takes that middle course which is safest.

(*To be continued.*)



The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier "Lion" engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

MR. C. G. GREY.

In answer to enquiries, the staff of THE AEROPLANE desires to state that Mr. C. G. Grey is still in a nursing home, today completing the seventh week since his accident. The plaster in which his fractured thigh is encased may be removed during the ninth week, but no definite opinion can be given as to whether he will recover the complete use of the leg until some time after that. In other respects his health is as good as can be expected. He desires to express his grateful thanks to those who have so kindly enquired after him.

THE ORIGINAL WRIGHT BIPLANE.

The announcement in many papers that Mr. Orville Wright—the first man who ever flew—is sending to the South Kensington Museum the original biplane on which he made his first flight, revives an old controversy which ought long since to have been settled on a common-sense basis.

Mr. Wright has a standing grievance against the Smithsonian Institution at Washington, the Capital of the United States, because that institution, while admitting that the Wright biplane of 1906 was the first machine which ever flew, demonstrated during the War, with the help of Mr. Glenn Curtiss, that the machine built by Professor Langley, Chief of the Smithsonian, at the same time as the original Wright, was a practicable flying machine.

The facts were that though the Wright machine did fly, it could only be kept in the air by a pilot who had the skill of a tight-rope walker. Except for the wing section it was aerodynamically wrong in every direction. It was of the "tail first" type, and soon proved itself to be a dead-end design, which could be developed no further, as was proved by Voisin, Cody, and others—besides being a death-trap. Its side areas were entirely misplaced. And its method of manual control was hopelessly unpractical.

It held together in spite of its flimsy construction because, owing to its uncontrollability in anything other than the simplest turns and ascents and descents, and, in almost calm air, it was never subjected to any severe strains. Pilots who attempted any more spectacular manœuvres killed themselves. The truth of these statements is proved by the fact that within a year after flying really began in 1909, the Wrights themselves abandoned their own design and took to the "tail-behind" type with approximately correct side-areas and humanly possible controls.

Professor Langley's machine, which he called an "aerodrome" (or air-runner), was a monoplane designed on proper aerodynamic principles, stable fore-and-aft and sideways. But the construction was bad, it was broken in its first attempt to fly, and Professor Langley could never afford to rebuild it.

Years afterwards it was reconstructed, strengthened where necessary, and was flown on floats, with its original engine, over Lake Keuka, by Mr. Curtiss, far enough to prove that it was a practicable flying machine.

Thus the true position was that the Wright machine was the first aeroplane to fly, but it was not a practicable flying machine. The Langley was the first practicable flying machine but it did not fly at first because of errors in construction.

Why the two parties cannot agree on that basis is difficult to understand,—except by anybody who knows Dayton, Ohio, which in some ways is as elemental as Dayton, Tennessee.

In any case, Mr. Wright has now shaken the dust of the Smithsonian off his original planes (re-covered), and is confiding his machine during his majestic pleasure to South Kensington, where it will cause considerable interest, some amusement, and a good deal of ungrudging admiration for those gallant fellows who survived taking the air in such a contraption.—C. G. G.

AIR TRANSPORT FOR SOUTH AFRICA.

The Star of Johannesburg for Wednesday, Jan. 11, published an exceedingly interesting expression of opinion by Mr. Samuel Evans, chairman of the Crown Mines Ltd., on the subject of air communications between South Africa and Egypt.

Mr. Evans points out that an air route bridging the gap between the Sudan and the South African railways, from say Khartum to Broken Hill, would be only about 2,600 miles long if it followed closely existing roads, or about 2,300 miles if it followed the more direct roads which are to be made. This was less than the air mail route across the United States, which had been in successful operation for some years, and that route could be covered in 30 hours' flying, or about 2½ days' flying by day only.

The United States air mail had to compete with efficient railway services. It saved time, and it paid. The suggested African route would save as many days for letters from South Africa to Europe as the American air mail could save hours, and Mr. Evans expressed his opinion that wit in a very short period the suggested service could obta enough traffic to cover its operating costs. He felt co vinced that practically the whole of the South Africa export of gold and diamonds to Europe would use this rou as soon as it was available, and that there would be a ve considerable mail and passenger traffic in addition.

The main difficulty to be overcome before such a servi could be inaugurated lay in the attitude of the South Afric Governments. The British Government was alive to the i portance of Imperial air communications, but the taxati system now in force in South Africa tended to drive and keep away all enterprising capitalists.

A service such as that suggested could only be successf if it secured the harmonious co-operation of the Administr tions of all the countries and territories served, and the Administrations in order to make this service possib should undertake :—

(1) To make and maintain an all-weather motor roa along the whole route, together with emergency landin grounds, telephone communications, etc.

(2) To provide and maintain all airports with sheds an hotels necessary.

(3) To remit Customs duties and other taxes on petro oil and other requisites for the service.

(4) To prohibit the direct or indirect taxation or rating the air service by provincial, municipal, or other authoritie and, further, not to tax in any way the capital invested i that service, nor its profits or dividends.

To compensate the Administrations concerned for thes concessions and outlays, Dr. Evans suggests that the should participate in the revenues earned by the service t the extent of, say, 1d. per letter and 10 per cent. of passer ger and goods revenues. By this method the various Gov ernments concerned would become interested in the succes of the venture and would therefore do all in their power t secure its ultimate success.

Mr. Evans's suggestions have aroused great interest i Rhodesia. *The Bulowayo Chronicle* of January 14 devote two columns to expressions of opinion on the subject.

Among these may be mentioned that of Mr. J. G McDonald, general manager of the Gold Fields Rhodesia Development Co. Ltd., that such a service as propose would save four days in the transport of bullion from thei gold fields, and could scarcely cost more than the presen railway company's charges. But, in any case, the saving c interest on the value of the gold would be of great import ance. In general, he agreed with Mr. Evans, and hope that the latter would keep hammering away until his schem was taken up.

Mr. W. D. Harris, Divisional Roads Engineer at Bulo wayo, estimated that the construction of the all-weather roa proposed by Mr. Evans would cost about £500 per mile, an would be well worth its cost. Such a road would have to b built some day, air service or no air service.

In the same issue of *The Bulowayo Chronicle* it is recorde that the Town Council of Salisbury has decided to lay out municipal aerodrome on the western commonage of tha town. 100 acres are to be allotted to this purpose at once and 100 further acres are to be reserved for future extension

CANADIAN AIR SURVEY DURING 1927

Since the inauguration of aerial photography in Canad six years ago by the Topographical Survey, Department o the Interior, working in conjunction with the Royal Canadia Air Force, it has repeatedly demonstrated its value in its application to mapping. This is particularly the case i Canada where by its use speed and economy are affected i mapping lands that by the ordinary methods of ground surve would involve a tremendous expenditure of time and effort

During 1927 a total of 45,850 square miles of territory was photographed—28,650 square miles by oblique photography and 17,200 square miles by vertical photography. The oblique photographs numbered 16,246 and the vertical photographs 46,340. The work was undertaken in eight of the nine provinces of Canada.

Individual operations included such large items as :— The extension of oblique photographs over an area of 15,200 square miles west of lake Winnipeg for forestry purposes; an oblique photographic operation over an area of 8,000 square miles over the Wood Buffalo Park near Fort Smith, N.W.T.; and a considerable number of vertical photographic operations of smaller individual areas throughout various parts of Canada. These vertical photographic operations embraced 2,500 square miles north of Ottawa; 1,720 square miles at Batiscan, Que.; 180 square miles at Chicoutimi, Que.; 645 square miles near Sudbury, Ont.; 440 square miles near Saint John, N.B.; and many others. The two last-mentioned items were undertaken on behalf of the Geological Survey of Canada.

The extension of oblique aerial photographs over the 15,200 square miles west of Lake Winnipeg was undertaken

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at the request of the Forest Service of the Department of the Interior, to assist in the work of locating timber for pulp purposes. The photographs were taken in the early summer, prints made immediately thereafter at Ottawa, and timber type maps prepared on scales of two inches to the mile, two miles to the inch, and four miles to the inch. These maps were immediately forwarded to the forest officer in charge of the timber cruising in the field. The data so provided rendered possible the elimination from cruising operations of extensive tracts of non-timbered country and a concentration of activities on areas of commercial value. Thus it was possible to cruise this entire area in the one season which it would have been entirely impossible to do without the assistance of photographic maps.

One of the interesting features in connection with the season's work was the covering by vertical aerial photographs of the route of the New Welland canal through the Niagara Peninsula. This was undertaken at the request of the Department of Railways and Canals for the purpose of showing the progress of the work in pictorial form. The advance made was readily seen by comparison with photographs of the same area which had been taken in 1921.

Another interesting operation was the photographing, both vertical and oblique, of Niagara falls, at the request of the Dominion Water Power and Reclamation Service, for the purpose of studying various features relating to the effect of ice conditions, the recession of the brink of the falls, etc.

The value of the aerial photographs taken on this work does not cease with their use in the actual mapping operations. The information upon them is of importance in all problems relating to development and in a study of such problems generally obviates the necessity of much personal investigation over the territory in question. The Topographical Survey has been made a central bureau for the collection and indexing of all aerial photographs. Here the ever-increasing numbers of these photographs are first converted into maps and are then kept on file for reference and record purposes.

The successful undertaking and application of aerial photography has been due to the close co-operation of the various organisations of the federal and provincial services and has facilitated to a very marked degree the work of investigating and developing the natural resources of Canada.

ARMSTRONG-SIDDELEY DEVELOPMENT IN CANADA.

Sir W. G. Armstrong Whitworth Aircraft Ltd. and Armstrong-Siddeley Motors Ltd. have concluded an agreement with the Ottawa Car Manufacturing Co., whereby the latter company will undertake the assembly of Armstrong Whitworth Aircraft and Armstrong Siddeley aircraft engines in Ottawa.

The Ottawa Car Manufacturing Co. is a subsidiary of the Ottawa Electric Co., which not only supplies Ottawa with electric power, but also manufactures fittings on a very large scale.

The Ottawa Car Manufacturing Co. became prominent during the war in the manufacture of field guns. Since the war, in addition to the manufacture of street cars, it has shown an active interest in aircraft construction and has undertaken several contracts for the reconditioning of R.C.A.F. aircraft, as well as for the construction of floats and other aircraft parts.

A part of their existing works has been set aside for the storing, complete overhauling, dismantling and rebuilding of Armstrong-Siddeley aero engines. A mile away, on an island in the middle of the Ottawa River, and close to the R.C.A.F. Testing Plant, test beds for Armstrong-Siddeley engines have been laid down, and will enable the servicing of the Jaguar engines installed in the R.C.A.F. Siskins and Atlases to be made most expeditiously.

Technical assistants, mechanics, and plant to enable the large number of engines in use to be efficiently maintained have already been sent out to Canada, this plan closely following the lines on which the care and maintenance of service machines is carried out at Coventry.

CANADIAN OFFICERS IN THE U.S.A.

At the request of the Canadian Government, the U.S. War Department has given permission for two officers of the R.C.A.F., namely Wing Cdr. G. M. Croil, A.F.C., and Sq. Ldr. L. S. Breadner, D.S.C., to proceed for a period of approximately one month to the Air Corps Training Centre, San Antonio, Texas, for the purpose of studying U.S. Air Corps training methods.

NEW CANADIAN TRAINING AIRCRAFT.

The Canadian Government has purchased three Consolidated Courier two-seat training biplanes (200 h.p. Wright Whirlwind engines) from the Consolidated Aircraft Corporation of Buffalo, N.Y., and these are due for delivery to Ottawa this month. They will be used by the R.C.A.F. for reserve training.

THE SALON DE L'AERONAUTIQUE, 1928.

It is announced that the eleventh *Salon de l'Aeronautique* will open on June 29, 1928, at the Grand Palais des Champs-Elysées, Paris. The closing date has not yet been fixed, but the duration of the exhibition will be roughly a fortnight.

The *Chambre Syndicale des Industries Aéronautiques* in conjunction with the *Aéro Club de France*, the *Ligue Aéronautique*, and the *Comité Français de Propagande Aéronautique*, is planning an important air meeting to take place immediately following the closing of the Exhibition.

SIR ALAN COBHAM'S PROGRESS.

On Feb. 3, Sir Alan Cobham and party left Khartum in the Short Singapore (two 650 h.p. Rolls-Royce Condor engines) and flew to Mongalla, Southern Sudan.

On Feb. 4 he took off from the Nile at Mongalla and after following the river up the rapids to Nimule, alighted on Lake Albert, which is 2,000 ft. above sea level, for lunch. From Lake Albert he continued to Entebbe on Lake Victoria, which is nearly 4,000 ft. above sea level.

On Feb. 6 he left Entebbe for Kisumu and Mwanza, carrying Sir William Gowers, Governor of Uganda, as passenger.

THE D.H. MOTH IN CANADA.—A D.H. Moth seaplane belonging to the Ontario Provincial Air Service at Longlac on Long Lake, Ont. This incidentally was the first Moth to be sold in Canada.

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THE ROYAL AIR FORCE.

The London Gazette.

Jan. 31.

General Duties Branch.—The following are granted S.S. comn. as Plt. Offs. on probation with effect from the dates indicated:—E. N. V. Everett (Jan. 13); E. J. H. F. Moreton (Jan. 13); A. F. Britton (Jan. 21).

Flg. Off. I. N. C. Clarke, D.S.C., is transferred to the Reserve, Class C (Jan. 17); Plt. Off. E. G. Searson relinquishes his S.S. comn. on account of ill-health (Feb. 1).

Stores Branch.—The following are transferred to the Reserve, Class B (Jan. 26):—Sq. Ldr. A. Burtenshaw, O.B.E., M.C., Flt. Lt. A. E. M. Dredge, M.B.E.

Accountant Branch.—The following Pilot Officers on probation are confirmed in rank and promoted to the rank of Flg. Off. (Dec. 4, 1927):—H. D. Connor, B. Chadwell.

Medical Branch.—Flg. Off. N. I. Smith, M.D., is promoted to the rank of Flt. Lt. (Jan. 25). The following Flt. Lts. are transferred to the Reserve, Class Dii (Jan. 28):—J. J. Clarke, B. Pollard.

Memorandum.—Sec. Lt. A. McL. Blain is deprived of permission to retain rank on conviction by the Civil Power (Dec. 22, 1927).

Reserve of Air Force Officers.—General Duties Branch.—Flt. Lt. C. H. R. Johnston is promoted to the rank of Sq. Ldr. (Jan. 31). The following Flg. Offs. are promoted to the rank of Flt. Lt. (Jan. 31):—S. C. O'Grady, M.C., C. R. Vaughan, H. V. Stammers, D.F.C., H. Lawson.

Flg. Off. F. J. Brunton is transferred from Class C to Class A (Dec. 8, 1927); Flg. Off. H. M. Gibbs is transferred from Class A to Class C (Jan. 27). The following Flg. Offs. are transferred from Class B to Class C:—A. C. Clinton (Aug. 14, 1927); J. S. C. Robinson (Dec. 11, 1927); R. C. Presland (Dec. 28, 1927). The following Flg. Offs. relinquish their comns on completion of service:—E. M. Bates (Aug. 12, 1927); A. T. Daw (Dec. 16, 1927).

Medical Branch.—Flt. Lt. G. R. Nodwell, M.B., is transferred from Class Di to Dii (Jan. 29).

Appointments.

Week ending Feb. 6.

General Duties Branch.—Wing Commanders A. G. R. Garrod, M.C., D.F.C., to Oxford University Air Squadron, for duty as Chief Instructor, 10/1. E. L. Tomkinson, D.S.O., A.F.C., to H.Q., Mediterranean, for duty as Fleet Aviation Officer on Staff of C. in C., Mediterranean Fleet, 31/12. A. F. A. Hooper, O.B.E., to R.A.F. Training Base, Leuchars, for Administrative duties, 6/2. R. P. Willock, to R.A.F. Station, Kenley, pending taking over command, 5/2. E. A. B. Rice, M.C., to Station H.Q. and Storage Section, Andover, to command, 1/2. G. R. Bromet, D.S.O., O.B.E., to R.A.F. Depot, Uxbridge, 10/1. W. S. Douglas, M.C., D.F.C., to R.A.F. Station, North Weald, pending taking over command, 4/1.

Squadron Leaders J. C. P. Wood, to R.A.F. Depot, Uxbridge, 29/1. C. H. Keith, to No. 6 Sqdn., 'Iraq., 10/1. A. G. Weir, to Air Ministry, Directorate of Organisation and Staff Duties, 5/2. G. H. Cock, M.C., to No. 99 Sqdn., Upper Heyford, 21/1. P. H. Cummings, D.F.C., to No. 11 Sqdn., Netheravon, 23/1. C. B. Dalison, A.F.C., to H.Q., 'Iraq, 13/1.

Flight Lieutenants P. Murgatroyd, to No. 47 Sqdn., Middle East, 2/1. R. M. Davy, to H.Q., Transjordan and Palestine, 8/1. D. C. Prance, to R.A.F. Depot, Uxbridge, 1/2. J. I. T. Jones, D.S.O., M.C., D.F.C., M.M., to Home Communication Flight, Northolt, 1/2. F. W. W. Wilson, to No. 480 Flight, Calshot, 20/1. A. S. Ellerton, O.B.E., to No. 99 Sqdn., Upper Heyford, 28/1. G. H. Mills, to No. 100 Sqdn., Bicester, 18/1. D. F. Anderson, D.F.C., to No. 2 Wing H.Q., India, instead of to H.Q., India, 6/12. E. H. D. Spence, to R.A.F. Depot, Uxbridge, 3/1. E. F. Turner, A.F.C., to School of Balloon Training, Larkhill, 24/1. R. A. George, M.C., to R.A.F. Depot, Uxbridge, 1/2. S. F. Vincent, A.F.C., to No. 1 Sqdn., Tangmere, 30/1.

Flying Officers H. C. V. Jolleff, to No. 99 Sqdn., Upper Heyford, 27/1. V. Harris, to No. 8 Sqdn., Middle East, 31/12. C. H. A. Stevens, to No. 15 Sqdn., Martlesham Heath, 1/2. F. G. H. Ewens, to H.Q., 'Iraq, 1/1. G. E. G. Lywood, to R.A.F. Depot, Uxbridge, 26/1. F. J. Fressanges, to No. 27 Sqdn., India, 1/1.

Pilot Officers W. G. Cheshire, to No. 47 Sqdn., Middle East, 19/1. A. R. Grenfell, to R.A.F. Depot, Uxbridge, 13/1.

Medical Branch.—Flying Officers V. V. Brown, to No. 5 F.T.S., Sealand, 23/1. M. Clancy, to No. 1 F.T.S., Netheravon, 23/1. F. E. Lipscomb and C. P. O'Toole, to R.A.F. Depot, Uxbridge, 23/1. S. B. S. Smith, to E. and W.S., Flowerdown, 23/1. G. H. Williams, to A. and A.E.E., Martlesham Heath, 23/1. D. A. Wilson, to H.Q., Air Defence of Great Britain, Uxbridge, 23/1.

Stores Branch.—Wing Commander C. L. Archbold, to H.Q., Air Defence of Great Britain, Uxbridge, 26/1.

Flight Lieutenants R. Craig, to H.Q., Middle East, 5/1. A. E. M. Dredge, M.B.E., to R.A.F. Depot, Uxbridge, 5/1. L. N. Sargent, to E. and W. School, Flowerdown, 1/2.

Pilot Officer A. H. E. Frost, to H.Q., Cranwell, on appointment to a Perm. Comn., 19/10.

Accountant Branch.—Flight Lieutenants J. M. Adams, to No. 45 Sqdn., Middle East, 6/1. W. W. Deane, to R.A.F. Depot, Uxbridge, 4/1.

Flying Officers R. W. Freeman, to R.A.F. Depot, Uxbridge, 15/1. F. M. Hall, to R.A.F. Depot, Uxbridge, 17/12. R. W. L. Glenn, to A. and A.E.E., Martlesham Heath, 27/1.

Chaplains Branch.—The Rev. J. A. Jagoe, M.A., to R.A.F. Base and Stores Depot, 'Iraq, 3/12.

The Funeral of Lord Haig.

Marshal of the Royal Air Force Sir Hugh Trenchard, G.C.B., D.S.O., Chief of the Air Staff, was one of the pallbearers at the funeral service of Lord Haig at Westminster Abbey on Feb. 3.

Members of the Air Council and officers of the Royal Air Force were among those who followed the gun-carriage and attended the service in the Abbey.

A Guard-of-Honour of the Royal Air Force was posted, with the Guards-of-Honour of the other Services, at the entrance to the Sanctuary at Westminster.

Wing Commander Sholto Douglas.

Wing Commander W. Sholto-Douglas, M.C., D.F.C., *p.s.a.*, whose appointment to command the R.A.F. Station, North Weald, is dated Jan. 4, was born in 1893 and educated at Tonbridge and Oxford. He entered the Royal Artillery from the Oxford University Officers' Training Corps in August, 1914, and was promoted Lieutenant, R.A., in June, 1915.

He learned to fly on a Caudron biplane at the R.F.C. schools at Le Crotoy and Shoreham and his Royal Aero Club Certificate, No. 1301, is dated June 2, 1915. He was seconded to the R.F.C. in July, 1915, and posted to No. 8 Squadron, which was then equipped with B.E.s and Bristol Scouts, at Marieux. He was appointed Flight Commander in December, 1915, and Squadron Commander in July, 1916.

In the summer of 1916 he was appointed to command No. 43 Squadron, R.F.C., on its formation at Stirling and in January, 1917, he took this Squadron overseas equipped with Sopwith 1½ strutters. They were stationed at Trezennes near Aires and did reconnaissance, photography and offensive patrols for the First Army. He was injured in a crash when setting out on patrol just after the Battle of Vimy Ridge.

In September, 1917, he took overseas the newly-formed No. 84 Squadron equipped with S.E.5as. This Squadron was attached to the Headquarters Wing and employed on offensive patrols during the Battle of Passchendaele. It suffered heavy casualties.

He was awarded the Military Cross in 1915 for distinguished service in the field and the Distinguished Flying Cross in 1917. The wording of *The London Gazette* of Feb. 12, 1919, notifying the award of the D.F.C. is as follows:—

> A very gallant officer and brilliant leader to whose personal influence and example is mainly due the fine record of his squadron, which, since Sept. 21, 1917, has destroyed 201 and driven down out of control 149 enemy aircraft. On Oct. 17, 18, and 19 last Major Douglas carried out most successful reconnaissances of the army front at exceptionally low altitudes (at times descending to 20 feet owing to dense clouds) and in face of intense hostile rifle and machine-gun fire.

He was placed on the unemployed list in April, 1919, and became chief pilot to Handley Page Transport Ltd. In March, 1920, he was appointed to a permanent commission in the R.A.F. with the rank of Squadron Leader, and posted to No. 1 Group H.Q., Kenley. In July, 1921, he was appointed to command No. 6 Flying Training School, Manston, and in April, 1922, he was posted to the R.A.F. Staff College, Andover, for the Staff course. In May, 1923, he was appointed to the Directorate of Training, Air Ministry. He was promoted to the rank of Wing Commander in January, 1925. In January, 1927, he was selected as one of the first R.A.F. officers to attend a course at the newly-formed Imperial Defence College.

Wing Commander Tomkinson.

Wing Commander E. L. Tomkinson, D.S.O., A.F.C., *q.s.*, whose appointment to H.Q., Mediterranean, for duty as Fleet Aviation Officer on the Staff of the Commander-in-Chief, Mediterranean Fleet, is dated Dec. 31, 1927, was born at Richmond, Surrey, in 1892, and educated at Dulwich College, Osborne and Dartmouth. He was gazetted Sub-Lieutenant, R.N., in 1912, and was appointed to the R.N.A.S. in July, 1914. He was appointed Flight Commander in May, 1915, and Squadron Commander in December, 1916. He served with R.N.A.S. units afloat from April, 1915, to March, 1919, and in Russia from April, 1919, to October, 1919. He was appointed to be a Companion of the Distinguished Service Order in 1919, in recognition of distinguished services during the War, and in North Russia since the close of hostilities. He was awarded the Air Force Cross in 1919 for distinguished services during the War. He was also awarded the Legion of Honour and the Russian Order of St. Anne.

In 1920 he completed satisfactorily a course at the R.N. Staff College, Greenwich, and was posted to the Directorate of Operations and Intelligence at the Air Ministry. In 1921 he was appointed to command the R.A.F. Unit in *H.M.S. Pegasus*. He was promoted to the rank of Wing Commander in 1925 and posted to H.Q. No. 10 Group, Lee-on-Solent. In January, 1927, he was appointed to attend the first course at the Imperial Defence College.

The Far East Cruise.

The Service Cruise of the four Supermarine Southampton flying-boats (Napier Lion engines) under the command of Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., which

SOME UNEQUALLED PERFORMANCES.

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Rome-Melbourne-Tokyo (54,000 km.) by Colonel de Pinedo and Campanelli (450 h.p motor).

The Tour of Europe (7,500 km.) in 61 hours from start to finish, by Arrachart and Carol (450 h.p. motor).

Warsaw-Tokyo-Warsaw (20,250 km.) in 130 hours, by Lieut. Orlinski (450 h.p. motor).

Paris-Pekin (10,500 km.) in 6 days, by Pelletier Doisy and Carol (450 h.p. motor).

Circuit of the West Mediterranean (6,000 km.) in 41 hours 50 mins. from start to finish, by Pelletier Doisy and Gonin (450 h.p. motor).

Night Crossing of the South Atlantic, by Colonel Sarmento de Beires (450 h.p. geared motor).

Paris-Bombay-Belgrade (14,500 km.) in 89 hours flying time by Sondermayer and Baydak (450 h.p. motor).

Circuit of Eastern Europe (8,000 km.) in 7 days by Commandant Weiss and Assolant (450 h.p. geared motor).

Circuit of the Mediterranean (10,700 km.) in 6 days by Pelletier Doisy and Gonin (650 h.p. geared motor).

Michelin Cup, 1925 (Captain Pelletier Doisy), 1927 (Capt. Challes).

Breguet Cup, 1925 (Adjt. Sahuc), 1926 (Adjt. Duroyon).

King of Servia's Cup, 1926 and 1927.

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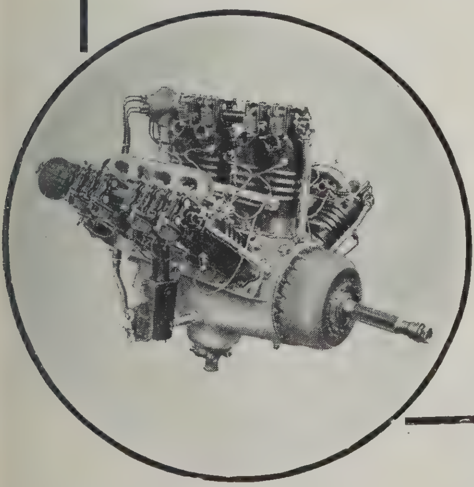

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left Cattewater on Oct. 17, arrived at Akyab from Calcutta on Feb. 3.

The Flight arrived at Rangoon on Feb. 6 and will stay there for a week.

Specialisation in the R.A.F.

Twenty vacancies for specialisation in aeronautical engineering, signals, armament, photography and air navigation have been offered for competition in 1928 among Short Service officers of the General Duties Branch. The following officers have been selected to sit for the examination in March next :—

Air Defence of Great Britain: Flg. Offs. I. G. E. Dale, J. D. Greaves, C. G. H. E. Lumsden, E. H. Newman and R. J. Stevens.

Inland Area: Flg. Offs. C. A. Bell, F. Boston (from India), R. W. E. Bryant, A. L. Ottway (provisionally selected), T. H. Perry-Keene, F. C. Rowland, A. C. H. Sharp, G. H. Walker and R. A. Wills.

Coastal Area: Flg. Off. J. F. Young.

Middle East: Flg. Offs. H. A. Evans-Evans (provisionally selected), E. E. Fallick and C. H. Noble.

'Iraq: Flg. Off. T. P. F. P. Fagan.

India: Flg. Offs. H. R. Bardon, C. Feather, A. N. Francombe, J. A. Hawkins, W. T. Holmes, T. K. Merrett, L. P. Pankhurst, E. G. E. Russell-Stracey and W. R. J. Spittle.

The Completion of Short Service Commissions.

The following officers of the R.A.F. who are serving on short service commissions are due to transfer to the Reserve on the dates indicated on the completion of their service on the active list :—

Flight Lieutenants.—(Apr. 1/28) D. E. Ward. (June 24/28) H. W. Corner, M.B.

Flying Officers.—(Apr. 1/28) R. B. Fleming, P. J. A. Hume-Wright, M. Wiblin, J. B. Wilson. (Apr. 7/28) W. J. Eagle. (Apr. 16/28) J. B. L. H. Cordes, A. W. Higgs. (Apr. 18/28) F. E. W. Davis. (Apr. 28/28) G. R. Keep, J. G. Murray. (May 4/28) F. A. Pumphrey. (May 14/28) F. Boston, R. H. Giles, A. S. Lewis, J. R. Pocock, R. T. Taafe, N. J. Wiltshire. (June 1/28) L. H. Weedon. (June 6/28) C. E. C. Penny. (June 8/28) E. D. Cummings, D.F.C., H. V. David. (June 11/28) L. Butler. (June 12/28) O. V. Lee. (June 14/28) R. R. Money, W. G. Pudney. (June 25/28) C. L. Lowe, D.F.C.

The R.A.F. Memorial Fund.

The following sum has been handed to the R.A.F. Memorial Fund as the result of the R.A.F. Display of 1927—£8,006 4s. 7d.

The R.A.F. share of the proceeds of the Royal Tournament held at Olympia in 1927 is £2,000. This sum has also been handed to the R.A.F. Memorial Fund.

The Fleet Air Arm.

Fleet Orders state that the *ab initio* instruction of naval and marine officers attached to the R.A.F. will take place in future at the R.A.F. Training Base, Leuchars, Scotland, instead of at No. 1 Flying Training School, Netheravon.

The new courses at Leuchars will begin on Feb. 29, June 12, and Sept. 25.

Telegraphists for the Fleet Air Arm.

The Times of Jan. 25 states :—

A greater number of volunteers for service in the Fleet Air Arm is required, and commanding officers are to bring to the attention of telegraphist ratings serving in their ships the conditions of service in this branch. Leading telegraphist A. J. Young, and telegraphists F. G. Webb, J. G. West, and W. E. Smith (Portsmouth); telegraphists A. Duckham, J. M. Cowie, A. Gray, S. T. Jackson, F. E. Bennett, and L. F. Woodall (Devonport); and telegraphists J. Swann, C. W. MacMillan, and H. F. Westgate (Chatham), have been selected to undergo the next qualifying course for telegraphist air gunner, beginning on Feb. 27.

The R. M. Groves Memorial Prize.

The R. M. Groves Memorial Prize for Aerial Navigation for the year 1927 has been awarded by the Air Council to Flg. Off. F. S. O'Hanlon, who reached the highest standard amongst those who passed the air pilotage course at Calshot during that year.

The four R. M. Groves Memorial Prizes were founded in memory of the late Air-Commodore R. M. Groves, C.B., D.S.O., A.F.C., who was killed while flying on duty in May, 1920. The prizes are for (1) Practical Flying; (2) Aerial Navigation; (3) Aeronautical Research, and (4) Essays on "A Forecast of Aerial Development."

R.A.F. SPORTS AND PASTIMES.

Rugby Football.

R.A.F. versus Coventry.—The R.A.F. were beaten by Coventry at Coventry on Feb. 2 by three goals (15 points) to nothing. This match was played in a storm of rain and on a sheet of mud about four inches deep. In spite of these appalling conditions the game was a fast, interesting, and, for the spectators, highly entertaining one. The Coventry team is a particularly light and active side and one understands that nine of the players on this occasion were under twenty years of age. That was about the only advantage they had over the R.A.F. except perhaps for the marvellous goal-kicking and touch-finding of A. Gascoigne, the Coventry stand-off half.

The R.A.F. forwards got the ball more often out of the scrum but they were not so agile in the loose as the Coventry pack. In attack the R.A.F. threequarters looked more promising and their handling was excellent in spite of the heavy going and the greasy ball. Unfortunately each movement broke down on the wing because the centres had not run straight enough. Norwood played an amazingly good game at stand-off half. He took every pass coming to him and showed speed and judgment and a capacity to do the unexpected which baffled his opponents.

The experiment of playing Chick on the wing instead of in the scrum looks like being a success. His speed and tackling qualities make him a very valuable back. If Gascoigne had not been there to show what Coventry can do in the mud with a leaden ball one would have excused the lack of good kicking on the Air Force side. But what Coventry can do yesterday the R.A.F. has got to be able to do to-morrow. After all kicking is an art which can be practised in silence and alone.

The Air Force started against the wind and rain which was blowing down the field at about 25 knots and were soon on the defensive. Hodder made a fine save. Norwood started a passing movement which gained a lot of ground before it broke down with a forward pass. They were driven back again with a long kick to touch by Franklin. Another good Air Force break away and an exchange of passing after a beautiful dummy by Norwood was crowded into touch. Adams tried to get a goal from a free kick but the ball only went a few yards. Lole made a great run on the Coventry left wing but was brought down by Russell on the line. However Lole got the ball again from the line-out and scored a try. Gascoigne kicked a goal.

The R.A.F. forwards kept up a good deal of pressure in the loose but each attack was driven back by the Coventry defence, whose kicks had the blizzard behind them. Coventry tried for a penalty goal but the ball just missed the cross-bar. A prolonged scrum ended with a free kick to the R.A.F. This part of the game was a series of free kicks, with the enormous advantage of the wind to Coventry.

In the second half a good opening by Norwood took the game onto the Coventry line but in spite of a long and desperate battle the R.A.F. did not manage to score and were slowly pushed back. Both sides began to depend more on kicking and forward play and the Air Force made one great dash headed by O'Malley. But the ball was difficult to control and nothing came of it.

By the time Coventry scored their second try it was hardly possible to distinguish one team from the other owing to the complete coating of Coventry over all. Gascoigne kicked another goal. The whole Air Force team rallied desperately and even started another passing movement but all in vain and the last five minutes saw Coventry score another goal.

The general expression of opinion among the spectators seemed to be that the score might easily have been the other way round on a dryer field.—C. M. McA.

The R.A.F. team were :—T. A. Hale-Munro (Duxford), back; J. S. Chick (Wittering), D. Massey (Halton), F. S. Hodder (Andover), and C. H. Bremridge (Sealand), three-quarter backs; T. Norwood (Kenley) and J. C. Russell (Air Ministry), half-backs; C. J. O'Malley (Halton), G. D .Adams (Halton), H. A. Constantine (North Weald), S. G. Collins (Gosport), P. G. Chichester (Manston), G. F. Cockell (Henlow), W. Munkley (Henlow), and J. Clarke (Calshot), forwards.

TO PLAY THE NAVY.

The following have been selected to play against the Navy at Twickenham on Feb. 11. Kick off at 15.00 hours :—

Flg. Off. T. A. Hale-Munro; A. N. Other, AC. D. Massey, Flg. Off. F. S. Hodder, Flg. Off. C. H. G. Bremridge; Flg. Off. R. V. Odbert, Sq. Ldr. J. C. Russell; Flt. Lt. C. J. S. O'Malley, F-S. G. C. Cockell, AC. W. Munkley, Plt. Off. H. A. Constantine, Cpl. M. G. Christie, Flt. Lt. C. D. Adams, Flg. Off. P. G. Chichester and L-AC. S. G. Collins.

Association Football.

R.A.F. versus Corinthians.—The Corinthians beat the R.A.F. at the Crystal Palace on Feb. 4 by nine goals to four. The game was played on a wet and sticky ground which made passing and ball control extremely difficult. The score at half-time was two goals all and the R.A.F. had the best of the game up to that point. The R.A.F. team were :—

AC. L. W. Quadling (Gosport), goal; Flt. Lt. B. Ankers (S. Farnborough) and Cpl. Bywater (Gosport), backs; Sjt. R. Stewart (Leuchars), L-AC. R. J. Robinson (Henlow) and Cpl. R. W. Baldwin (Uxbridge), half-backs; AC. C. Parrish (Flower Down), AC. L. Oates (Henlow), AC. J. Ewers (Uxbridge), AC. L.S. Smith (Martlesham Heath), and AC. G. Ward (Wittering), forwards.

Boxing.

The R.A.F. Individual Boxing Championships will take place at Halton on Feb. 29, and Mar. 1. The Championships are divided into three classes, (A) Officers, (B) Airmen of the Regular Air Force and (C) Airmen of the Auxiliary Air Force. The contests for the officers will be feather, light, welter, middle, light-heavy, and heavy-weights. The contests for the airmen of the Regular Air Force will be the same as for the officers but will include in addition fly and bantam-weights. The contests for the Auxiliary Air Force will be for light and middle-weights only.

All entries close by noon on Feb. 17. The Secretary of the R.A.F. Boxing Association is Sq. Ldr. A. E. Pettingell, Home Aircraft Depot, Henlow, Bedfordshire.

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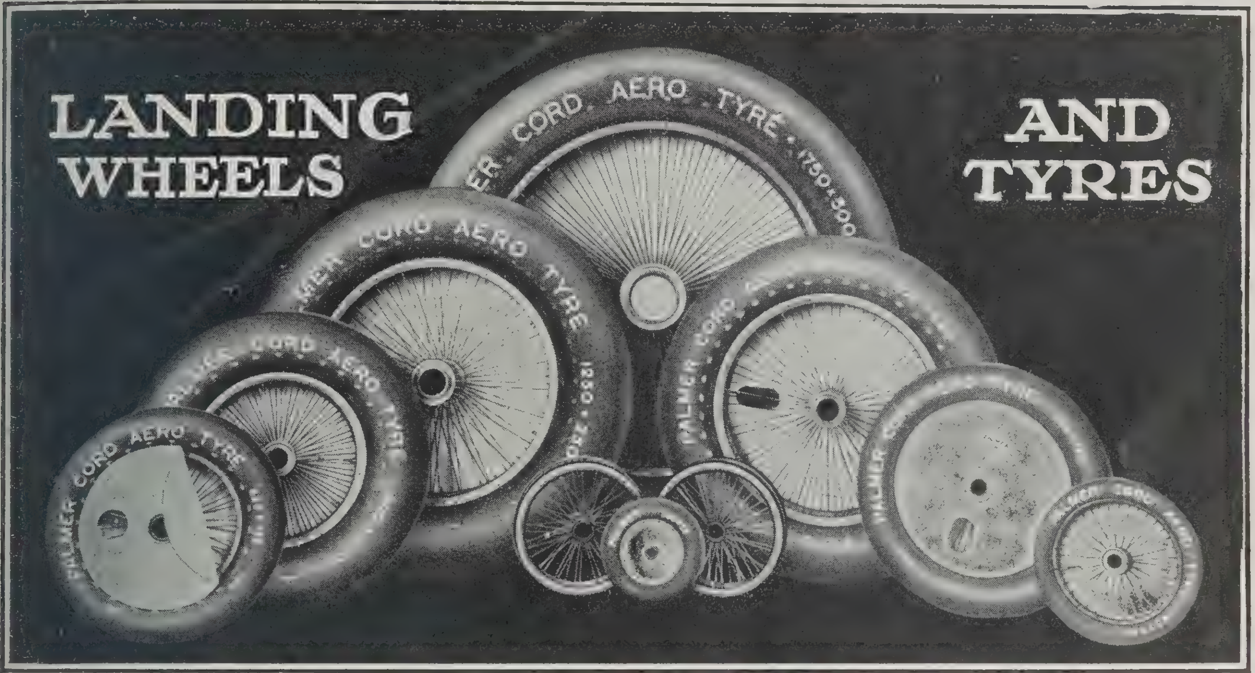

STANDARD SIZES.

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575×60	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
700×100	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
975×225	192	185.	60.32	Central
,,	194	185.	55.	125/60
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
,,	191	350.	150.3	Central
1750×350	193	400.	125.	Central

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AIRCRAFT IN SMALL WARS.

A lecture on " Aircraft in Small Wars " was given by Wing Commander R. H. Peck, O.B.E., R.A.F., at the Royal United Services Institution on Feb. 1.

Air Marshal Sir John Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., Air Officer Commanding-in-Chief Air Defence of Great Britain, was in the Chair.

Introducing the Lecturer, Air Marshal Sir John Salmond said that Wing Commander Peck was in the Directorate of Operations and Intelligence at the Air Ministry and he had, in addition, practical experience of small wars.

Wing Commander Peck in the course of his Lecture disclaimed any Air Ministry responsibility for what he was about to say. He said that his subject was a controversial one but he would not steer clear of controversy because controversy was productive of thought. Every new idea met with a hostile reception and although he knew that there were two sides to the subject, on this occasion he would state his own case and leave the other side.

He included in his definition of " Small Wars " campaigns such as that against Germany in East Africa although a German officer had claimed that no less than 137 General Officers were employed by Great Britain in that campaign. The chief characteristics of small wars were that they were against mobile armies operating in their own country which invariably contained plenty of good natural cover for them. The forces operating against such a country found very heavy disadvantages. The supply had to be carried entirely by pack. Artillery and tanks had not the same value in this sort of warfare and of recent years mechanical superiority had been lost because the tribesmen usually possessed modern weapons and the knowledge to use them.

The supply problem would be solved to a large extent by the use of the six-wheeler which, by means of convoy, would protect the lines of communication. The other reply to the natural advantages of uncivilised enemies and the improvement in their arming was the employment of aircraft. But in order to derive the full benefit of the Air Arm the Air Commander must be allowed full freedom of action. Hitherto delay had followed permission for air action which lessened its value to a very great extent. Also the temporary suspension of air action which had occurred in the past, inevitably meant more action later.

He would urge Commanders who had air units to allow no delay after permission had been given for air action. As soon as targets were found they should be engaged. New weapons required new tactics. The tactician should use his weapons to the best advantage and tactics must be altered to suit the characteristics of the new weapon. The tanks had been a classic instance of the delay in altering tactics to suit new weapons. It had taken twelve years to decide the separate rôles of tanks and infantry. Aircraft had suffered in the same way.

THE USES OF AIRCRAFT.

Aircraft could be used in small wars in a variety ways. (1) As the primary arm: land forces co-operati in protection of air bases. (2) In co-operation, but also a primary rôle, with irregular troops or gendarmerie. In co-operation, in a secondary rôle, with columns of troo (4) In a variety of ancillary uses.

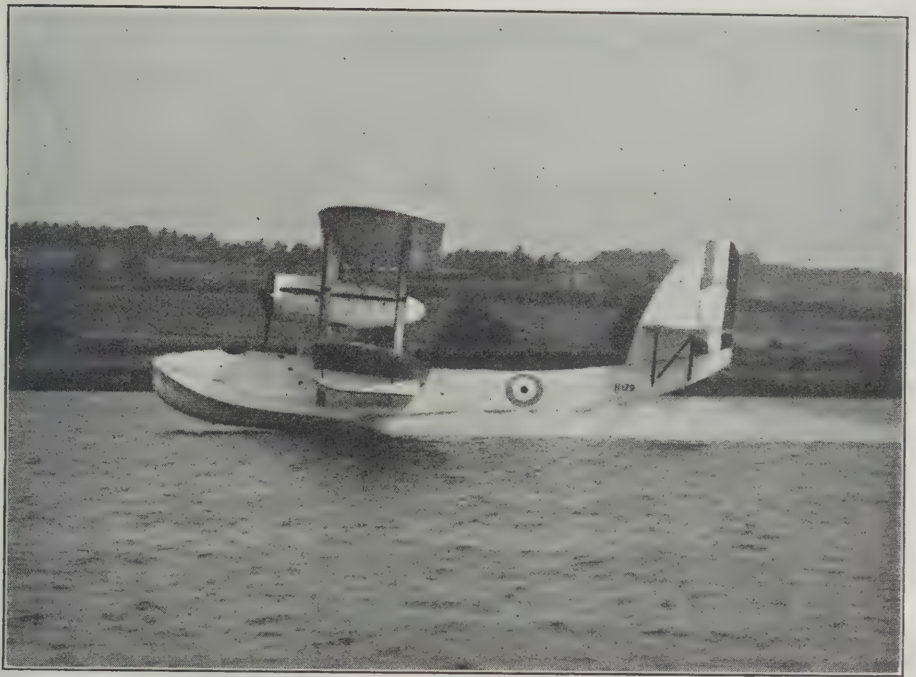
The present lecture would deal with (1) only. The of aircraft as a primary arm was in the nature of a pr liminary bombardment and strengthened the arm irregular forces. Their object must be to exert the minimu force which would restore law and order with the lea expense and with the least resulting animosity. The method of sending an expeditionary column on the operations was like trying to take a trick with too small card or sending a boy on a man's job. It resulted in takin away from the poorest man in the world even that whi he hath and at the end of it there was nothing left. could not sit on the ashes and had to cut our way again after laying up a legacy of bitterness against ou selves and losing lives and money. The fact that action was a much cheaper method of dealing with troub of this sort prevented the delay caused by reference to hard-up Government, a delay which allowed a small troub to grow into a large one. An example of the waste lives and money caused by the expeditionary column syste had been shown on the North-West Frontier of India whe more than 60 punitive expeditions had been engaged in t past quarter of a century and twenty million pounds ha been spent in the first twenty years of the present centur The present solution consisted of building strategical roa to make these expeditions easier but that solution was on shifting the same process a step further forward. A method to keep the peace more cheaply ought to be tri and the money thus saved, used to develop the count of the tribesmen. The cure for all this unrest lay in makin the country self-supporting. Productive development wou make these expeditions unnecessary. It was always a pi to do with explosives what should be done by policeme with sticks.

THE ADVANTAGES OF AIR ACTION.

When air action was available an ultimatum should issued as soon as the trouble began. Good effect was gaine by a certain amount of suspense but it was not necessary dally for two months from the date of the ultimatum. Th ultimatum usually resulted in clearing the villages of inhabitants and moveables. The Lecturer understood th the tribes did occasionally leave behind a few mothers-i law and other stubborn old ladies but even these usual yielded to a valorous discretion as soon as the openi rounds began. The sight of the aeroplanes themselves w

SMALL-WAR COUNTRY.—A Flight of No. 6 (Army Co-operation) Squadron, R.A.F., doing a reconnaissance over Baibu, Kurdistan, during the operations of 1923. Gara Dagh, which can be seen in the background, is 11,500 ft. high.

SHORT ALL-METAL



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often enough to bring the tribes to reason but if this failed a few delay bombs timed to disturb the sleep of the unjust and at the same time obviate the necessity for night-flying generally proved effective.

He did not agree with the theory that the tribes became accustomed to air action and grew to disregard it. Air action took time for its full result to be achieved. It worked like a kind of third degree. While it was pending, grazing had to cease and the stock had to be kept under cover. Cooking was difficult and the tribes had to spend uncomfortable nights up in the mountains. He had been assured that the tribesmen retired to their caves and made rude gestures at the aircraft from rocky security. There was not a word of truth in this assumption.

Air action was more merciful than any other form of warfare. Its effect was more by discomforture than by casualties. The bombs were small unless particularly destructive measures were essential and then the casualties were small.

Air action could be applied while the trouble was yet slight. In 'Iraq aircraft could be over any part of the country on the same day that the warning reached Baghdad, although in some cases a base was established at the centre of operations. When air action started at once, all could see that the offender was not one who was worth backing up. It had been argued that action which did not kill was worthless but even a doctor would admit that it was not always necessary to kill a patient in order to cure him. It had also been argued that the bomb was an inaccurate missile, dropping from God knows where and falling on God knows what, but it should be remembered that it was not until 1926 that the R.A.F. at home had full-range bombing targets for training purposes. To-day the bomb was a weapon of precision. Bombs did not cause widespread destruction without intention. Where necessary the bomb could be made larger and more destructive than any shell. It had been proved by the reports of intelligence officers and by the treatment meted out to our prisoners that air action did not cause particular animosity but at the same time it was quite untrue that the moral effect of air action wore off. Air action increased in moral effect as time went on.

THE PROOF OF THE PUDDING.

Air action was a very inexpensive method of dealing with this sort of trouble because the only expense was in ammunition and a small amount of extra fuel and a few minor items for transportation. Also there were no commitments and no risk of tactical reverse. Where it had been tried it had always succeeded. 'Iraq was not the only example of the success of this method. The operations in Waziristan in 1925 and the Mohmand operations in 1927 had been nasty and expensive nuts to crack and they had been quickly and cheaply cracked by air action. These operations had succeeded in spite of the undue delay for reference to Higher Commands and the handicap of old aircraft. The R.A.F. had only had a few small orders but they had delivered the goods and he could not understand why there had been so much reluctance to give them jobs to do. He thought they had made good their case to be given further orders. He hoped that when the next small war came along the R.A.F. would be let in to see whether the air method could be applied before sending 80,000 men on a shooting expedition.

THE DEBATE.

Opening the Debate, **COLONEL ROWAN ROBINSON, C.M.G., D.S.O.,** said that the soldiers on the Indian Frontier had great admiration for the work of the R.A.F. and he did not want to belittle its work in any way. But he would like to look at the problem from a more general point of view. The Indian problem was the greatest small war problem in the British Empire. It was necessary to control the tribes and to secure the lines of communication behind our frontiers. We had got to solve the economic problems of the tribes. Using the R.A.F. method was adopting the line of least resistance.

The question of resulting animosity had not been decided. Personally he thought there was animosity if the tribes were bombed or shot-up.

The policy of tip-and-run had been given up by Lord Rawlinson. Razmak was an example of Lord Rawlinson's policy of building roads. The advance garrison at Razmak had been established in 1923 and there had been no trouble in that area since that date. He thought that the other troubles so successfully dealt with by the Air Force would be solved by Lord Rawlinson's policy of opening up the country. These roads were not merely strategical. Not only was Lord Rawlinson's policy solving the problem of Waziristan but it was also solving the problem of protecting the lines of communication. The tribes always remembered the raids or soldier methods of punitive action and these had led to their attacking us at the times when we were weakest.

COLONEL HOWARD said that the Army very much appreciated the value of aircraft. Speaking from his experience in Kurdistan in 1923 he agreed with the Lecturer except for the claim that action by aircraft would force tribes to battle. He thought that action ought to be decisive. He considered that trade and strategical roads must be one and the same thing. He suggested that moral effect was often mere boredom. Air action always required subsequent action by ground troops

CAPTAIN E. ALTHAM, R.N., said that he had been one of the fe Naval officers to use aircraft in small wars. He had used seaplane for Naval co-operation in the Baltic. His experience had suggeste that we could not dispense with any of the three Services, all which were essential to each other. He thought the Air Force woul continue to be the hitting force.

Replying, **WING COMMANDER PECK** said that undoubtedly tediu was a contributing cause of the moral effect of air action. He sidered that there was less animosity after air action than after act which did more harm. He could not understand why it was alw pre-supposed that the bomb was fatally attracted towards the sex. It was curious that when a shell fell it always hit a sold but when a bomb fell it always hit his wife and child.

He did not think we should mix up the making of roads and th sending of expeditions. Good roads made it possible to send exped tions more expeditiously. If a country could get a cheaper metho of control it would have more money for making roads. It had bee proved that the moral effect of air action increased instead decreasing.

AIR MARSHAL SIR JOHN SALMOND said that all were agreed that th real solution for the North-West Frontier was civilisation. The A Force did not claim to be able to do this. The Razmak policy ha certainly been a successful one. If there had been no question having to civilise we could, given enough aircraft, have kept enough pressure to keep the tribes from raiding. The lack of finan prevented a policy of putting the Army in to keep order while built the roads. The Air Force could keep order cheaply.

When there was occasion for air action, air action ought be used. The Lecturer had asked that the R.A.F. should be given fair chance and he agreed with him. The R.A.F. did not claim to able to take over vast tracts of country and civilise it. In 1922 Henry Rawlinson had said that if the 'Iraq scheme succeeded would try it in India. He only asked that the R.A.F. should given a trial to show what they could do.

THE DEPUTY-DIRECTOR OF WORKS AND BUILDING

Mr. H. E. Oakley, C.B.E., M.I.C.E., who retired from t post of Deputy Director of Works and Buildings, The A Ministry, on Feb. 1, was the guest of honour and t recipient of a presentation, at a dinner given by membe of the staff of his Department on Jan. 28 at the First Aven Hotel.

Mr. Oakley entered the Civil Service in 1890, when joined the Works Department of the Admiralty. While Admiralty service he was engaged on the construction docks at Chatham, Haulbowline, Malta and Hong Kong, the airship sheds at Kingsnorth and Cardington, and t air stations at Cranwell, Lee-on-Solent and Calshot.

He was transferred to the Air Ministry on the formati of the Royal Air Force in 1918, and has since been responsil for much of the Air Force's most important building ope tions, including the Boys' Training Establishment at Halto the enlargement of the Cardington Airship Shed, and ma other new buildings at home and abroad.

The new Civil Aircraft buildings at Croydon have be erected under his supervision.

He became Deputy-Director of Works and Buildings 1918, received the O.B.E. in the same year, and the C.B. in 1924.

Mr. Oakley is succeeded by Mr. R. F. M. Pearson, M.I.C.

Mr. Pearson entered the Works Department, Admiral in 1899, and was employed on constructional work at Dev port, Deal, Jamaica, and other naval stations, and betw 1912 and 1914 he carried out works for air stations un Admiralty Control. In 1914 he was lent by the Admiralty the Greek Government as one member of the British Na Mission to that country under the command of Admi Mark Kerr. He received the fourth class of the Order the Redeemer for his services to the Greek Navy.

In January, 1917, he returned to Admiralty service, was employed on works for the R.N.A.S. He was tra ferred to the Air Ministry in 1918, and became Assista Director of Works in charge of works connected with R.A.F. expansion scheme in 1924. In this capacity he responsible for the construction of thirteen new R.A stations.

THE U.S. NAVAL AIR PROGRAMME.

On Jan. 26 Rear-Admiral Moffett, Chief of the Bureau Aeronautics, informed the House of Representatives' Na Committee that 759 aeroplanes were necessary to equip five aeroplane carriers and twenty-five cruisers included the Administration's 740 million dollar (£148,000,000) na construction programme. This is in addition to the th sand aeroplanes provided under the five-year naval gramme.

Admiral Moffett explained that the carriers would acc modate 375 aeroplanes and the cruisers 100 aeroplar Fifty additional training aeroplanes were needed in addit to 234 aeroplanes as reserve equipment.

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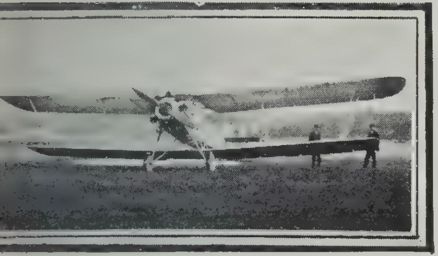

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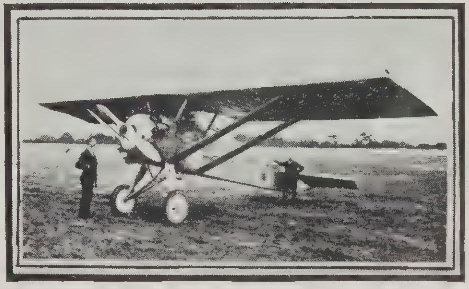

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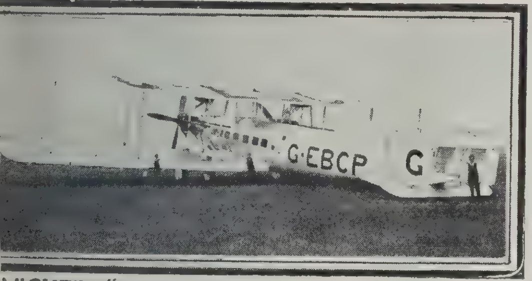

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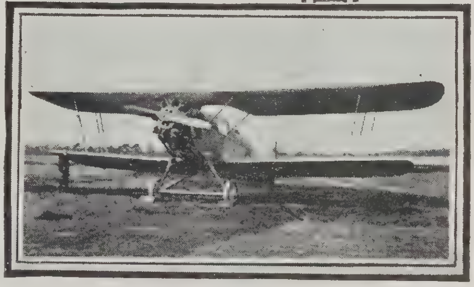

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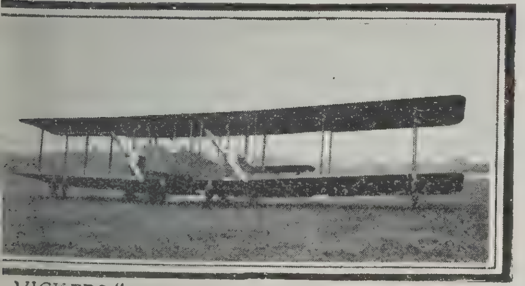

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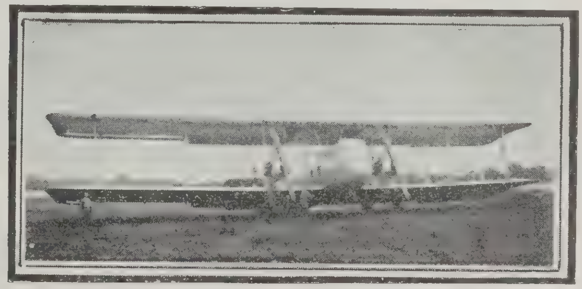

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THE ROYAL AERONAUTICAL SOCIETY.

The Royal Aeronautical Society, with which is incorporated the Institution of Aeronautical Engineers, will hold an informal dinner and discussion at the Engineers' Club, Coventry Street, W.1, on Tuesday, Feb. 14, at 7.30 p.m.

The subject to be discussed is "Why the Aeroplane is Superior to the Seaplane in Imperial Communications." The argument for the Aeroplane is to be opened by Major Mayo, and the counter argument in favour of the seaplane by Col. the Master of Sempill.

Members who desire to be present are requested to make early application for tickets, price 7s. each, to the Secretary, The Royal Aeronautical Society, 7, Albemarle Street, W.1. Morning dress will be worn.

On Thursday, Feb. 18, a lecture to be given before the Royal Aeronautical Society by Mr. G. P. Douglas, M.C., D.Sc., on "Experiments on Model Airscrews at High Tip Speeds" will be one of outstanding importance on the theory of airscrews. Mr. Douglas will consider the behaviour of an airscrew when the tip-speed is increased up to and beyond the speed of sound. The lecture, which will be fully illustrated, will be delivered at 6.30 p.m. at the Royal Society of Arts, 18, John Street, Adelphi, W.C

The Trustees of the Daniel Guggenheim Fund for the Promotion of Aeronautics have, for the second year in succession, made the munificent grant of $5,000 to the Royal Aeronautical Society.

The grant made in 1927 proved to be of the utmost value to the Society, enabling it to extend its scope and influence and take part in bringing about that state of air-mindedness which is as much a part of its objects as it is that of the Daniel Guggenheim Fund.

During the year the membership of the Society was greatly increased, the size of its Journal was doubled, many papers were published which would, without the grant from the Fund, have had to be held over, and a number of new branches were started.

COLONEL LINDBERGH'S TOUR.

On Jan. 29 Col. Charles Lindbergh left Bogota, Colombia, at 06.48 hours and arrived at Maracay, Venezuela at 18.10 hours. Twice during his flight he was forced to go off his course, firstly to find a suitable gap in the Andes and secondly to avoid a storm and low clouds. He crossed a ridge of the Andes at 12,000 feet.

On arrival at Maracay, he was welcomed by President Gomez and was appointed a Commander of the Order of the Bust of the Liberator.

On Feb. 2 he arrived at San Juan, Porto Rico, from St. Thomas, Virgin Islands. Here he was received by a crowd estimated at 100,000, the largest ever assembled in San Juan.

On Feb. 6 he flew from Santo Domingo to Port-au-Prince, Haiti, where he was welcomed by President Borno and a large crowd.

SOUTH—NORTH AMERICA.

On Jan. 30 MM. Costes and Le Brix, who since their flight across the South Atlantic have been making a propaganda flight throughout South and Central America on the Breguet XIX biplane (500 h.p. Hispano-Suiza engine), arrived at Mexico City, from Guatemala City. They were received by the French Minister, the U.S. Ambassador and later by President Calles.

On Feb. 4 they flew from Mexico City to New Orleans where they were officially greeted by the Mayor and members of the Citizens' Committee. This is their first contact with United States soil.

Their flight will be continued to New York, but it is understood that any attempt to fly from New York to Paris will be opposed by both the Breguet and Hispano-Suiza companies. It is pointed out that the west to east flight has already been made and that another flight would not add appreciably to the prestige of French Aviation.

TOWARDS RUSSIA.

Mr. Van Lear Black started his programme of serious air travel for this year on Saturday, Feb. 4, when he left Croydon on the Fokker FVII H-NADP, piloted by Mr. Geysendorffer, at 08.51 hours, and landed without intermediate stop at the Tempelhofer aerodrome, Berlin, at 15.14 hours.

Mr. Black's intention is to proceed from Berlin to Moscow on the next stage of this flight. At the time of leaving Croydon it was uncertain whether he would be able to obtain the necessary permission from the Russian authorities, and so far no news on this point has been received in England.

In connection with Mr. Black's efforts to obtain permission to fly to Moscow, it is interesting here to record the officers of Deutsche Luft Hansa—which has no di interest in this flight—have given every possible assista and much good advice to him in his dealings with Russian Government.

AN INDIAN COMMERCIAL DEVELOPMENT.

Mr. Bernard Leete, who won World-wide fame for hin by flying a Moth to India in the company of Mr. Ne Stack, and was recently in England, is now back in I again organising his business for what one hopes will big developments during this year. He has been joinec Mr. Vetch, who did some good flying on Mr. Leete's in India during Mr. Leete's absence in England until he the misfortune to crash at Shillong, in Assam, during exhibition flight, owing to the telegraph authorities set up some wires across a gap between the trees through w he was in the habit of landing, without giving any war of their action

The Aerial Advertising, Travel and Survey Agency which was the name of Mr. Leete's firm, is now being organised, but Mr. Leete's business address is still 3, Ma Lane, Calcutta. He and Mr. Vetch have ordered a Wid and an Avian, with Mark II Cirrus engines, and have quired a Baby Avro for their own amusement. The c two machines will be used for school work, advertising tracts, taxi-rides and tours. One wishes the new firm e success.

THE BOEING AIR MAIL DEVELOPMENTS.

In the first five months' operations of the Chicago–Francisco division of the Transcontinental Air Mail R which on July 1, 1927, was taken over by the Boeing Transport Company from the Post Office Department, 72 miles was flown without an accident. In this period 36 cent. of the entire air mail poundage of the United S was carried over this route and in addition 525 passen were transported in the five months.

The Boeing Air Transport Co. has twenty-four Boeing Planes (425 h.p. Pratt and Whitney Wasp engines) in mission and employs twenty-five pilots.

The Wasp engine is being replaced in a numbe machines by the 525 h.p. Pratt and Whitney Hornet fo over portions of the route where the combination of h load and difficult flying country make the increase of h power a necessity.

For the passenger service the company is acquiri number of three-engined Boeing biplanes and these wi fitted with 425 h.p. Wasp engines, probably using th gines which are being replaced by Hornets in the si engined mail aircraft.

AIRPORTS IN THE UNITED STATES.

According to *The Times* an American Airports Corpor has been formed by important aviation and banking int to develop a chain of airports across the country.

The organising directors are Mr. William B. Mayo, engineer of the Ford Motor Company, Mr. James W. worth, Jr., Mr. George Mixter, of the engineering fi Stone and Webster, Mr. J. Leslie Kincaid, and Mr. George Gabrielson. All have special interests in air port companies. The president of the new corporati Colonel Stedman Hanks, a banker, and Major-General O'Ryan has been appointed legal counsel.

The corporation hopes to take over some existing air to construct others, and to lease the chain of ports t craft operating companies.

THE ITALIAN DEFENCE BUDGET.

According to *The Times* the provisional Budgets fc financial year 1928-29 the estimates of the Italian Mi of War show a reduction of 67,000,000 lire [about £74 and the estimates of the Ministry of the Navy a reducti 120,000,000 lire [about £1,334,000], while the Aviation remains the same as for the current year. Part of reductions may possibly be accounted for by the inc and stabilised value of the lira.

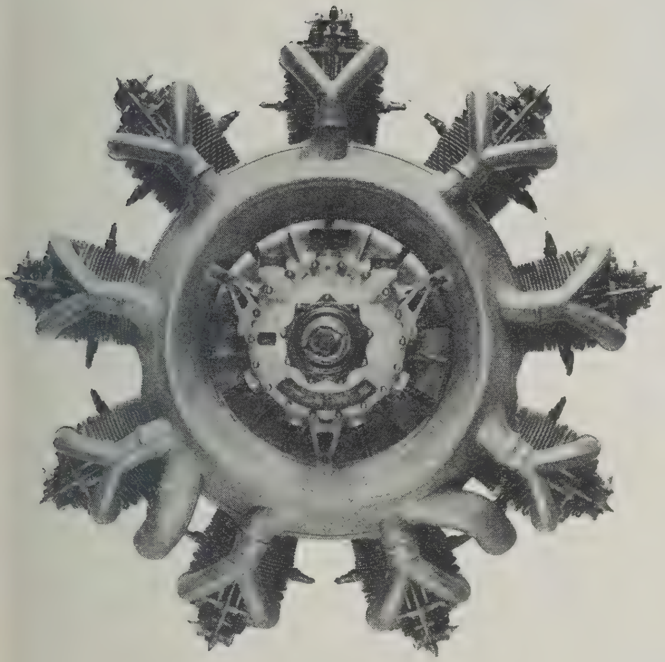
THE AUTOGIRO IN FRANCE.

The Société Avimeta of Courbevoie (Seine) has acquir licence to construct the Cierva Autogiro in France.

AN ERROR OF DIMENSION.

By an unfortunate error the bore of the cylinders Bristol Mercury Series I engine was printed on pa of THE AEROPLANE for Feb. 1 as $3\frac{3}{4}$ inches. This figure have been $5\frac{3}{4}$ inches.

"Bristol"



The Jupiter engine is in service in every European country, in Africa, in Australia, in Asia and in America.

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THE DRAINING OF AERODROMES.

In this country all aerodromes seem always to need draining. Any large fairly flat piece of grassland in our climate can scarcely avoid becoming boggy at times, and the cost of the necessary excavation work for installing a proper drainage scheme on the average aerodrome is very high, if the usual methods of digging trenches by hand is employed.

The method now being used for draining the Stag Lane Aerodrome belonging to the De Havilland Aircraft Co. Ltd. should therefore be of interest to all who have aerodromes in their care, for it enables trenches to be cut and drains to be installed with a minimum of labour and—equally important—with very little disturbance of the surface.

The essential feature of this scheme is the use of special tools for excavating drains. One of these—which may be called a trenching tool—consists of a steel cutter, or share, of a shape which can be seen in the photograph, carried on a heavy baulk of timber. Linked to this share is a wedge-shaped timber box.

The share is pressed into the ground, and hitched to a wire rope coupled to a portable winch driven by a small petrol engine. When the winch is started, the share makes a rectangular cut in the soil, and the cut soil is forced up by the following wedge, and neatly laid on the ground by a system of inclined boards fixed on the surface of the wedge.

Owing to the shape of the cutting edge on the share, the act of towing it through the earth tends to draw it still deeper into the ground. The timber baulk however resists this diving tendency, and consequently the tool cuts a clean, uniform rectangular trench. In heavy clay a first cut 11 in wide by 1 ft. deep can be made at the rate of about 1½ m.p.h.

This is followed by a second cut, made with a similar, but narrower and deeper, share, so that a 2-ft. trench to take 6-in. drain pipes can be made at the rate of ½ to ¾ of a mile per hour.

Such trenches are needed in clay only for main drainage lines, and usually only three or four of these are needed on any one aerodrome.

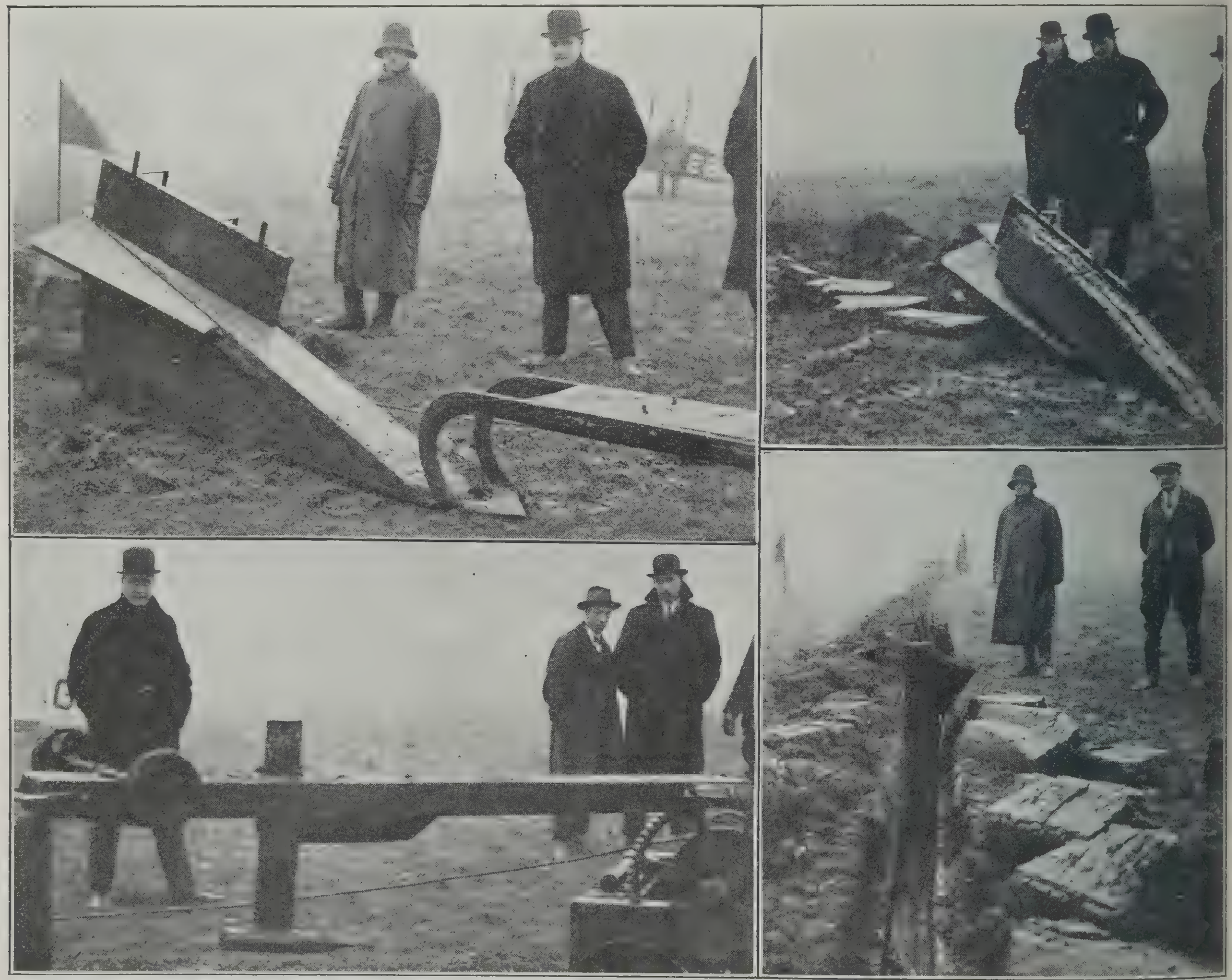
Into these main drains a system of small feeder drains ar laid. In clay—which is common on aerodromes—these ar made by a tool called the mole-drainer, without any disturbance of the surface. This mole-drainer—which is show in a photograph—consists of a steel cylinder about 3 in diameter and 18 in. long, with a pointed end, carried on steel blade, about ¼ in. thick and 20 in. deep, carried fron another timber baulk.

This steel cylinder is dropped into a main drain trench hitched to the wire rope on the winch and pulled throug the ground. The cylinder is mounted at a negative angl of incidence, so that it also tends to dive, but is held at steady depth below the surface by the timber baulk whic rides over the surface. It ploughs through the ground 3-in. diameter hole, leaving only a cut in the surface.

At Stag Lane the mole-drains are spaced about four yard apart. The surface below which they have been driven ca be used at once, and their efficacy as drains is show by the fact that parts of the aerodrome already drained ar now usable, but were last winter under water.

This particular system of excavating for drainage purposes is the invention of Mr. Charles Herridge, of Claremon House, Buckham Weston, Wincanton, Somerset, who ca either undertake contracts for complete drainage schemes, o supply the equipment necessary for those who wish to carr out the work themselves.

The power-plant used for towing the excavating machinery which consists of a very robust petrol engine, a train o gearing and a rope drum mounted on an easily portabl trolley, is manufactured by Fairbanks Morse and Co. Ltd. of 87, Southwark Street, London, S.E.1. This power-unit—which uses about 1½ gallons of petrol per working day—has been exposed to the weather of the past few months a Stag Lane, has received no skilled attention, required n repairs or maintenance, and has worked with a total absenc of trouble during that period.



THE DRAINING OF STAG LANE.—Top left is the trenching tool, showing the cutting share and the elevating wedge. On the right are two views showing the way in which main trenches are cut. Bottom left is seen the mole draining tool, which makes subsidiary drains without disturbing the surface.

FAMOUS AIRCRAFT

USING A AND P COLD DRAWN WELDLESS STEEL TUBES

he Short "Singapore" is the first all-metal Flying Boat signed by British Constructors, and represents developments llowing the production, by Messrs Short Brothers of ochester, of a metal hull to the order of the Air Ministry, in 24 Sir Alan Cobham is using this machine for his African rvey tour It is fitted with twin Rolls "Condor" 111A ater-cooled engines, each developing 700 H P at 2,000 R P M, d it can be flown with full load on one engine First flown August, 1926, it has since undergone successful trials the M A E E, Felixstowe

A and P Tubes are used

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Before any operations are carried out, the "blooms"—as the tubes in the rough are called—have to pass a laboratory test to determine that the constituents are up to specification; after that, they are "normalised"—*i.e* subjected to a special heat treatment which counteracts any defects that have developed during the process of rolling Then they are marked with a number indicating their quality, for the purpose of identification as they are going through the mill

The next operation is to reduce one end of the bloom in a power forging hammer The tube, in the drawing operations which follow, is pulled through the die by means of the "tag" thus formed At the same time a small hole is punched in the tube at the point where the tag begins, to allow the acid and water to work through the tube in the subsequent pickling and washing operations

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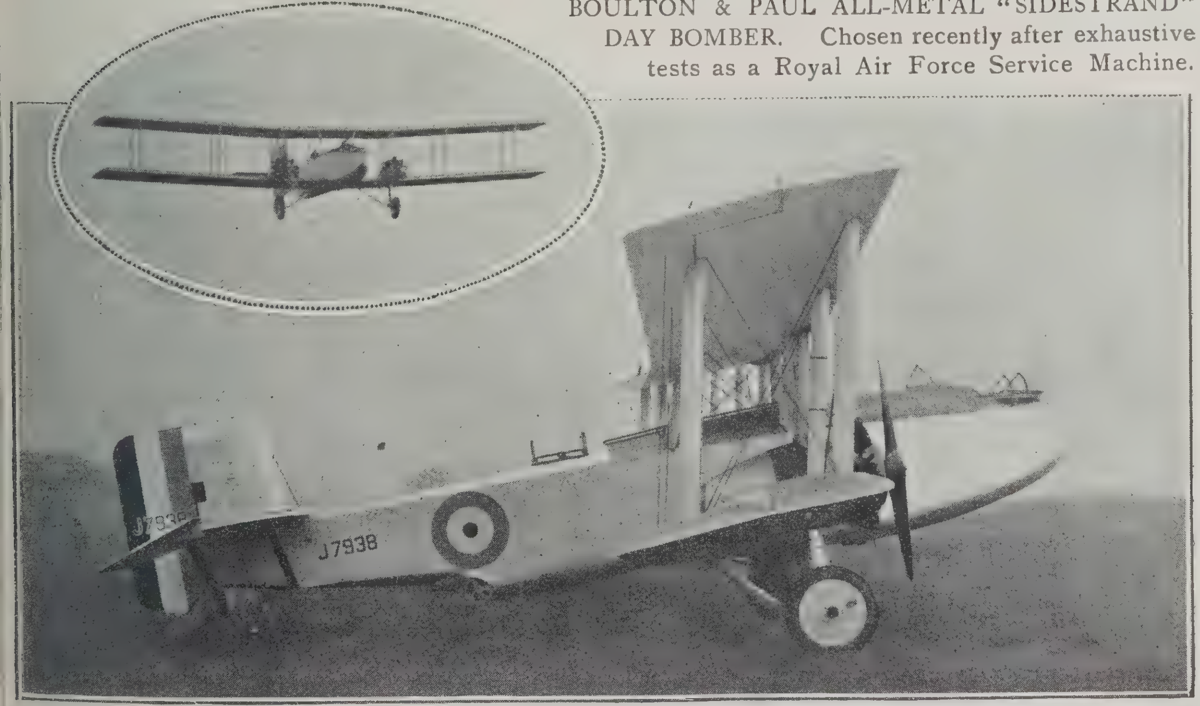

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AUSTRALIA IN 18 DAYS.

On Feb. 7, at 06.45 hours, Mr. Bert Hinkler left Croydon in his Avro Avian (32/80 hp. Cirrus II engine) in an attempt to fly to Australia in eighteen days. He intends to proceed by stages of 1,000 miles, his first day's flight taking him to Rome.

THE D.H. MOTH IN SWEDEN.

A civil flying school was opened in Stockholm on Jan. 31 in the presence of members of the Government, the officer commanding the Swedish Royal Flying Corps and other important officials.

This school is equipped with three D.H. Moth seaplanes (A.D.C. Cirrus engines).

A WESTLAND WIDGEON FOR INDIA.

The French Motor Car Company of Calcutta has purchased a Westland Widgeon III light monoplane (32/80 h.p. A.D.C. Cirrus II engine). This machine will be used for demonstration purposes and will be the first of its kind to be seen in India.

A PARACHUTE JUMP FROM A MOTH.

On Feb. 2 Mr. de Weiss, one of the demonstrators of the Irving Air Chute Co. Inc., of Buffalo, N.Y., who is on a visit to this country, gave a demonstration jump from a D.H. Moth at Letchworth.

The Irvin parachute, which is standard equipment for the R.A.F., is made at Letchworth, but none of the employees of the British factory had ever seen one of their products tested in the air.

The jump was made from Mr. Roy Irving's D.H. Moth, and after the demonstration Mr. de Weiss stated that he had found that the Moth was the easiest aeroplane from which he had ever jumped.

A YORKSHIRE ACCIDENT.

On Feb. 5, Mr. Albert Critchley, a member of the Yorkshire Aeroplane Club, crashed at Sherburn-in-Elmet aerodrome and he died from his injuries within a few minutes.

He was flying alone in a Blackburn Bluebird and according to press reports he was indulging in "stunt" flying at a low altitude. His machine got into a spin and he had insufficient room to recover before he hit the ground.

Mr. Critchley, who was a popular member of the Yorkshire Aeroplane Club, lived in Newton Road, Chapeltown, Leeds. He was 27 years of age, and was a native of Bolton, Lancashire. For the past three years he had been employed at the Leeds Educational Mental Clinic. He had served in the Royal Air Force and was on the Reserve.

THE A.D.C. CIRRUS ENGINE.

The production of the Cirrus engine manufactured by A.D.C. Aircraft, Ltd., of Waddon, Surrey, is proceeding apace. The normal output up to a few weeks ago has been from 8-10 engines per week but the steady influx of orders has necessitated the starting of a night-shift solely on Cirrus engines and the production is now being increased to 16 engines per week.

Among the recent orders received is one from the Italian Government for three engines. These engines are to be fitted into three types of light aeroplanes which are being built for a competition to be held this summer to determine a suitable type for use by flying clubs. Therefore although this order is small it can be regarded as a relatively important one, and one that may easily lead to further orders.

An order for twenty has been received from the Air Ministry for use in the D.H. Moths which are being acquired for use by Communication Squadrons.

The Australian Government has purchased eighteen engines. Twelve of these are to be fitted into the D.H. Moths at present under construction by the De Havilland company for the R.A.A.F. and the remaining six are spare engines.

The Canadian Government has purchased five engines, Canadian Vickers Ltd. ten engines, and Western Canada Airways Ltd. one engine.

An order for five engines has been received from the Raab-Katzenstein Flugzeugwerk, of Cassel, which company is about to build the D.H. Moth under licence in Germany. In Germany the Moth will be known as the Motte.

Two engines have been despatched to Mr. Clarence Chamberlin in Hoboken, N.Y. Here he is producing two experimental light aeroplanes, one a monoplane and the other a biplane. These two machines will be fitted with various types of medium-powered engines in order to determine the most suitable type for use in the production models.

A.D.C. Aircraft Ltd. has concluded an arrangement with a Japanese engineering company for the manufacture of the Cirrus engine under licence in Japan.

Negotiations are also being made with three or four American corporations for the manufacture of this engine in the United States.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Feb. 5.

Flying Time 13 hr. 15 min. *Dual Instruction* 6 hr. 40 min. *Soloists* 5 hr. 15 min. *Passenger Flights* 1 hr. 20 min. *Instruction.—With Mr. F. G. M. Sparks*—Miss Spooner, H. Kennedy, G. C. Gotheridge, G. W. Hall, Miss Johnson, G. Eady, C. E. Murrell. *With Mr. S. L. F. St. Barbe*—G. Eady, E. M. Alexander. *Soloists.*—R. Sanders Clark, H. Solomon, A. F. Wallace, J. J. Hofer, C. E. Murrell, G. W. Hall, E. C. T. Edwards. *Passenger Flights.—With Mr. S. L. F. St. Barbe*—Miss V. Cholmondeley. *With Mr. F. G. M. Sparks*—Miss H Cholmondeley.

Flying Return for the Month of January.

Dual, 21 flights, 8 hr. 45 min. *Solo*, 33 flights, 14 hr. 30 min *Passenger Flights*, 6 flights, 1 hr. 50 min. *Test Flights*, 18 flights, 3 hr. *Total Flying*, 78 flights, 28 hr. 5 min.

The January return shows the worst month since the Club has been in existence.

We have now completed six months' flying under the revised subsidy scheme and comparing this with the same period last year there is a falling off of nearly 300 hours' flying time, due entirely to the weather conditions during the last four months. It is hoped these conditions will improve and so enable the Club to make up a little of the lost ground.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Feb. 4.

Flying Time 3 hr. 5 min. *Instruction* 1 hr. 15 min. *Soloists* 50 min. *Tests* 1 hr. *Pilots.*—Lacayo, Twemlow, Meads.

Notes.—The past month has been the worst in the history of the Club, so far as flying hours go. Largely the weather has been to blame, but crashes and engine troubles towards the end of last year have also played their share. By the middle of this month we hope to have our full fleet serviceable once more and, with five members waiting to do their first solo, we hope to make quite a hole in the Treasury's pocket.

Two new arrivals on the staff this week. Capt. Baker, M.C., A.F.C., took charge as chief instructor and aerodrome manager on Wednesday, while the following day Mr. Howard Pixton joined the ground staff Two valuable "captures" as they say in League circles. (Transfer fees not disclosed.)

Miss W. Brown back from her Australian tour with the English ladies' Hockey team, has added to the ranks of our private-owner members by purchasing a new Mk. III Avian this week.

We offer our deepest sympathy to the Yorkshire Club in connection with their accident on Sunday.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Feb. 5.

Flying Time 16 hr. 30 min. *Instruction.—(Mr. Parkinson)*—6 hr. 25 min. *Soloists* 30 hr. *"A" Pilots* 7 hr. 30 min. *Tests* 50 hr. *Passengers* 1 hr. 15 min. *Under Instruction.*—Miss Rambaut, Miss Klyver, Messrs. De Pledge, Griffiths, Horn, V. Heaton, Glenny, Hayton, Dr. Alderson. *Advanced dual.*—Mrs. Heslop, Mr. De Pledge. *Soloists.*—Mr. De Pledge, Mr. Glenny. *"A" Pilots.*—Mrs. Heslop, Messrs. H. Ellis, Wilson, Turnbull, R. N. Thompson, C. Thompson, Mathews, Dr. Dixon. *Passengers.—With Dr. Dixon*—Miss Howison, Dr. Davidson. *With Mr. R. N. Thompson*—Mr. Fairless, Mr. Walker. *With Mr. H. Ellis*—Mr. Pollock. *With Mr. C. Thompson*—Mrs. Heslop, Mr Luckman, Miss Bulmer. *With Mr. Parkinson*—Mr. Ramsay, Mr. Oakes, Mr. Nash.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, Yorks.]

Report for week ending Feb. 4.

Flying Time 4 hr. 50 min. *Instruction* 1 hr. 35 min. *Soloists* 2 hr. 40 min. *Passengers* 35 min. *Instruction.—With Mr. Beck*—Messrs Little, Sugden, Yeomans, Balfour, A. Crowther. *Soloists.*—Messrs Ellison, Critchley, A. Crowther, H. Crowther. *"A" Licence Pilots.*—Messrs. Thomson, Wood, Lister. *Passengers.—With Mr. Beck*—Miss Walker, Mr. Cope.

We refuse to give any excuse this week, we are sick of repeating ourselves.

On Monday Mr. Beck gave an address in Doncaster on "Civi Aviation" at the Rotary Club, and on Tuesday on "The Ligh Aeroplane Movement" at the "U and I" Club. On Thursday Mr Ely addressed the "19" Club on "Modern Aircraft and its Uses." A certain amount of publicity was given in the local press so tha from further efforts of this description we hope to enrol a few mor members. Our membership at the moment consists of the following:—140 Full Flying Members, 57 Associate Members, 27 Lady Members 17 Honorary Members,

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth, Birmingham.]

Report for week ending Feb. 6

Flying Time 3 hr. 35 min. *Dual.—With Mr. McDonough*—Messrs H. Lattey, R. Brinton, and E. Wynn. *Soloists.*—Messrs. G. Perry an R. Brinton.

General Report.—Flying was only possible on two days owing t rains and gales.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Feb. 5.

Flying Time 10 hr. *Instruction* 8 hr. 15 min. *Soloists* 35 min *Passenger Flights* 50 min. *Test Flights* 20 min. *Instruction.—With Flt. Lt. Swoffer*—Mrs. Ranald, Hon. H. R. Grosvenor, Lt. Musselwhit Flg. Off. Southey, Captain Kirby, Messrs. Cripps, Watson-Taylo Shepherd, Southcliffe, Lowe-Wilde, Wells, Heath, Fawkes, Bayne Bowen, Curtis-Nutall, Parker, Falconer, and Puttock. *Soloists.*—Mr

'Typhoon' and 'Cyclone'
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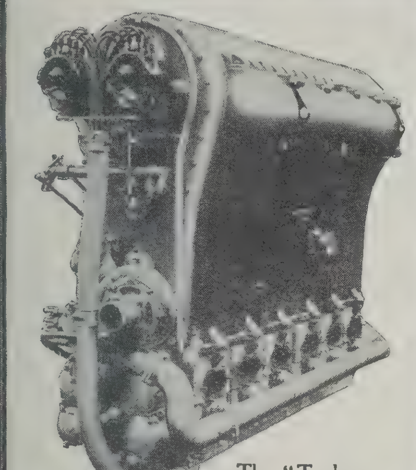
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Ranald, Flg. Off. Southey, Lt. Musslewhite, Messrs. Bowen and Cripps and Falconer.

We began this week with a new Instructor, a new Ground Engineer, and a new Aeroplane.

Taking them in the order named, our new instructor, Flt. Lt. Swoffer, arrived on Jan. 25 in our new Avro Avian, G-EBVI, which he had brought down from Manchester for us. Flt. Lt. Swoffer has just left No. 11 (Bombing) Squadron, R.A.F., where he was instructor of the *Ab Initio* flight.

He joined the R.F.C. in 1916 and remained on in the R.A.F. until 1919. After a sojourn in Africa, he rejoined the R.A.F. and went to the C.F.S. as instructor in 1923. In August, 1926, he was posted to No. 11 (Bombing) Squadron.

Mr. E. Lenny, our new Ground Engineer, is also ex-R.A.F., having served from June, 1921, to December, 1925, at home and in Palestine. After leaving the R.A.F. he joined the De Havilland Aircraft Co., and left this firm to come to us at Hamble.

Lastly our new Aeroplane. As previously mentioned, this is an Avro Avian and is proving very popular with the members, two of whom, Capt. Kirby and D. A. R. Cripps, have already made on it the qualifying tests for their R.Ae.C. licence.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwich.]

Report for week ending Feb. 5.

Flying Time 9 hr. 15 min. *Instruction.—With Mr. Lines*—Messrs. H. Mack, N. A. Lindley, E. Varden Smith, G. Surtees, A. G. Barratt, N. Brett, A. Cooper, and G. Barker. *Soloists.*—Messrs. R. T. Harmer, W. P. Cubitt, W. A. Ramsay, and H. Pank. *Passengers.*—Mr. G. Watson Parker.

Notes.—An informal meeting of the members is to take place on Feb. 23, at 8 p.m., at the Royal Hotel and it is important to note that Air Vice-Marshal Sir Sefton Brancker, K.C.B., Director of Civil Aviation, has very kindly promised to come down and address us on Aviation generally, which is sure to be extremely helpful and interesting. After Sir Sefton's address the meeting will merge into a smoking concert details of which will be forthcoming later.

On Thursday the Club was honoured by a visit from Lady Bailey, Mr. Courtney Prentice and Dr. Sleigh, of the Suffolk Club, to discuss important matters relating to the Air League Challenge Cup Race. (These two gentlemen by the way informed us they have recently acquired some new-fangled machines called "Wheel back Chairs." We don't know anything of these but preseume they will soon be flying over in one of them to see us.)

Next Wednesday Sq. Ldr. Rea has very kindly consented to address a meeting of members in the Club House on General Flying. He is prepared to answer all sorts of awkward questions and should have a busy time.

Commercial Flying.—Under this heading we have an interesting announcement to make. A Lowestoft gentleman has asked for a quotation to be flown to Germany and back and a definite price has been quoted. There is every reason to think it will be accepted. (We remember the time very well when one was flown there free of charge and the ticket did not always include return fare.)

We are pleased to welcome the Right Hon. The Viscount Elmley, prospective Liberal Candidate for East Norfolk, as an active member of the Club and six others who joined this week. (Not all prospective members, of course.)

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Feb. 4.

Flying Time 7 hr. 40 min. *Instruction.—With Mr. Lowdell*—Miss Edwards, K. Peck, H. Billinton, F. Verney, R Brown. *Soloists.*—Dr. Jas. Sleigh, S. Schofield, C. N. Prentice.

Notes.—On Thursday, Dr. Sleigh and Mr. Prentice flew over on the Club's Bluebird to Norwich to discuss arrangements for the Air League Challenge Cup race.

Mr. Blake arrived at Hadleigh Aerodrome on Friday flying Bluebird G-EBRE, which has recently been reconditioned by the makers. This machine is now fitted with adjustable rudder bars also an exhaust ring, which is a vast improvement.

Mr. Prentice successfully passed his tests and secured his "B" Licence this week.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Feb. 4.

Flying Time 10 hr. *Instruction* 5 hr. 5 min. *Soloists* 3 hr. *Passengers* 1 hr. 55 min. *Under Instruction.*—Mr. Bathurst, Mr. Greenhill, Mr. Arnold, Mr. Hall and Major Hume. *Soloists.*—Mr. Bathurst, Mr. Downes-Shaw, Mr. Arnold, and Mr. C. E. Pitman. *Passengers.—With Mr. Bartlett*—Dr. H. S. Hele-Shaw, F.R.S., and Mr. H. F. Tiarks. *With Mr. E. Hopper*—Mrs. Aspinall.

On Jan. 30 we had the pleasure of a visit from Dr. H. S. Hele-Shaw, F.R.S., whose seventy-three years of age did not prevent him from thoroughly enjoying a flight in a Moth with Mr. Bartlett over the City and Docks.

The Scottish Flying Club.

[Sec.: Harry W. Smith, 101, St. Vincent Street, Glasgow.]

Report for January.

Total Hours Flown—33 hr. *Under Instruction*—56. *Soloists*—36. Total number of actual flights undertaken—91. Number of days when flying was possible—10. Number of Members who secured their "A" Licence—4. Total number of Members with "A" Licence—11. The following were the members who secured their "A" Licence:—Mr. A. M. Dunlop, Flg. Off. Franks, Messrs. J. D. Latta, Harry W. Smith.

The month of January has proved to be a most disastrous one from the flying point of view. For 12 days on end no flying whatever was possible, and the aerodrome became so much like a lake that suggestions were made that we should fit floats to the Moth and use it as a seaplane. On the 15th, things brightened up a little and taking-off and landing was possible on a narrow strip near the cemetery boundary of the aerodrome. Whilst the actual flying was unsatisfactory, the Committee were, however, active, and it was arranged that the Club should put on order at once their second Moth, and it is hoped to get delivery about Feb. 15. Any member desirous of accompanying the pilot from Stag Lane to Renfrew on this flight is requested to communicate with the Hon. Secretary.

In our last report it was stated that the members of the Club would have the opportunity of meeting the Executive after the meeting on the first Thursday of every month, and this will be the case for the month of February, but the day of the Executive meeting has been changed from Thursday to Monday, so that the meeting will take place in March on the first Monday instead of on the first Thursday.

The Tees-side Aero Club.

[Joint Secs.: J. N. Ogilvie and H. W. Moss, County Bank Chambers, Middlesbrough.]

A Committee Meeting was held on Feb. 2. In the absence of the President and Vice-President, Mr. Bishop presided. A letter was read from the Surrey Flying Services stating that the Club could have the free use of the ground at Thornaby-on-Tees. This ground, which is leased by the Surrey Flying Services, was formerly an aerodrome site, about 38 acres. All we want now is an aeroplane and a hangar.

Sir Park Goff, K.C. and M.P. for Cleveland, wrote accepting with pleasure our invitation to become one of the Club's Patrons. Meanwhile we are continuing our appeal for Patrons and funds.

Mr. Bishop suggested that we should hold an Air Pageant in the near future. It was decided to go into this matter at the next Committee Meeting, to be held on Feb. 16.

The Liverpool and District Aero Club.

The new Liverpool and District Aero Club had its baptism on Saturday, Feb. 4, at Hooton Aerodrome—a baptism in a very real sense, for rain fell heavily until 15.00 hours.

Nevertheless the baptismal ceremony was a great success and the new Club definitely went into the clouds.

Over twenty new members were enrolled on the ground and were given free flights.

The close and generous co-operation of the Lancashire Aero Club with the new Liverpool Club was evidenced by the presence of two pilots from Woodford, and Mr. John Lord, of A. V. Roe and Co., was also present during the afternoon.

The first official flight of the Liverpool Club was made by one of the members—Miss Marjorie Hughes, of Lea Hall, Mollington, in a Moth piloted by Mr. T. Neville Stack.

Lady Bailey with her D.H. Moth joined Mr. Stack, who flew an Avian (his Moth having had an unsuccessful argument with an obstruction on the ground), and later Mr. A. M. Blake, on a Blackburn Bluebird, also went up. For the best part of an hour the three pilots delighted the watchers on the aerodrome with aerobatics.

A dinner was held in the evening at Eastham Hotel, but before dinner was served Mr. Stack lectured on his flight to India. The dinner was presided over by Mr. Anderson, and there were about fifty guests present, including Lady Bailey and Mr. Stack with his ukelele. It was indeed a happy social evening.

Two aeroplanes have been promised to the new Club—one from Sir Charles Nall-Cain, and the other from the Blackburn Aeroplane and Motor Co.

The Cinque Ports Flying Club.

The Hon. Secretary of the Cinque Ports Flying Club records that the Mayor of Dover has now become a Vice-President of the Club and that the Mayors of three Cinque Ports, namely Hythe, Folkeston and Dover, are now Vice-Presidents. Thus, with the Earl Beauchamp Lord Warden of the Cinque Ports, as President, the Club is certainl getting support which justifies its name.

The Committee of the Club are to be congratulated on the chang of name. "The East Kent Flying Club" was singularly undistinguished, whereas the new title is not only distinguished bu distinctive.—C. G. G.

The Singapore Flying Club.

The Singapore Flying Club hopes to begin operations in Marc Two D.H. Moth seaplanes (A.D.C. Cirrus engines) have been shippe out and the date of opening largely depends on the date of the arrival.

Following on the renting of ten thousand square feet of land fro the Singapore Harbour Board for the purpose of building slipway etc., this latter body has now offered to construct a road leading fro Trafalgar Street to the hangars.

The following gentlemen have been appointed to serve on the Flig Committee:—Capt. Geoffrey Freyburg, O.B.E., R.N., the Mast Attendant, as representative of the Government, Mr. C. Jackson, M Keith Bon and Mr. H. S. Chapman, with the Club Captain, M R. Johnstone, and the chief instructor as ex-officio members.

Sir Hayes Marriott, the Colonial Secretary, the Commander-in-Chi of the China Station, and Sir Charles Wakefield have been added the list of honorary members.

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 17; Tuesday, 16; Wednesday, 15; Thursday, 14; Friday, 15; Saturday, 18; Sunday, 1.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 36, passengers 184, freight 12 tons.

Air Union:
Paris—London: Machines 23, passengers 63, freight 12½ tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 13, passengers 36, freight 3¼ tons.

Sabena:
Brussels—London: Machines 10, passengers 4, freight 1¼ tons.

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 12, passengers 10.

Private:
Machines 2, passengers 1.

Total number of trips by British Machines, 38, carrying 185 passengers. Foreign Machines, 58, carrying 114 passengers.

COMPARATIVE FIGURES.

Week ending Feb. 5:
Machines 96; Passengers, 299; Crews, 177; Total personnel, 376.
Corresponding week, 1927:
Machines, 64; Passengers, 151; Crews, 105; Total personnel, 256.
Corresponding week, 1926:
Machines, 57; Passengers, 122; Crews, 70; Total personnel, 192.
Corresponding week, 1925:
Machines, 59; Passengers, 86; Crews, 73; Total personnel, 159.
Corresponding week, 1924:
Machines, 69; Passengers, 103; Crews, 107; Total personnel, 210
Corresponding week, 1923:
Machines, 50; Passengers, 144; Crews, 87; Total personnel, 231.
Corresponding week, 1922:
Machines, 54; Passengers, 92; Crews, 87; Total personnel, 179.
Corresponding week, 1921:
Machines, 22; Passengers, 25; Crews, 27; Total personnel, 52.

Croydon Notes.

The first week of operations from the new buildings has passed with very little of the confusion which might have been expected to occur over a move of this character, and everybody seems to have settled into his—or her—new office with considerable satisfaction.

The new buildings are distinctly comfortable, well warmed, well lighted and surprisingly quiet. From the passenger's point of view the layout of the various sections through which they must pass is convenient, and the new cement apron outside the buildings is a great improvemen on the quagmire through which they had to pass at the ol station.

But there are already signs that serious trouble may aris in the fairly near future. This concrete apron is laid on t edge of a very imperfectly drained portion of the aerodrom which is now heavily waterlogged. Tail-skids have alrea started their fell work on the ground surrounding the "t mac," and it has already been necessary to restrict t approach to the front of the new buildings very considerab and to start laying down chalk to build up the cut-aw earth.

When we get a spell of dry weather passengers will ag be subjected to the appalling duststorms raised from t chalk by slip-streams. It is very necessary that a prop scheme of drainage for this section of the aerodrome shou be put in hand, in order to avoid a renewal of this nuisanc

At present there is no public enclosure available at th new airport. There is to be one in the neighbourhood the hotel, but it will not apparently be open until the hot is ready, some time in March. In the meantime the aer drome police are carefully scrutinizing the credentials of would-be entrants to the aerodrome, and turning away tho of the public who merely want to see the new airport.

From some points of view this may be desirable, but seems unwise to give the interested public an idea that t aerodrome is now strictly private. Some temporary pub enclosure can surely be provided pending the completion the hotel.

There is still a good deal of complaint as to the ren charged for accommodation in the new buildings. The rents are made necessary by the ruling of the Treasury th all tenants are to be charged at a rate which will give fair commercial return on the capital value of the premis But the premises are admittedly planned on a scale larger than is justified by the actual business of Croyd Aerodrome at present, and therefore the rents form a ve heavy charge on the operators concerned.

In the case of a concern such as Surrey Flying Servi this matter of rent is a very serious one. Unless some co cession can be made to them, it is very likely that they w have either to abandon some part of the repair and overh work which they have conducted in the past, or else remo their workshops to some less expensive site.

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rown Bros. Ltd., of Brown's Buildings, Great Eastern
eet, London, E.C.2, have recently placed on the market
accessories primarily meant for the use of motorists but
ally of interest to those who have to work on aircraft.
ne of these, known as the "V" utility pliers, is a pair
pliers curved into such a shape that they can reach round
ind a pipe strut, or the like, and get a sound grip on a
or other such article. These should undoubtedly form
t of every mechanic's tool kit. These pliers, in the six-
h size, cost 3s. 4d. per pair.

he other is the "Noscrew" hose clip. This is a hose-
which differs from all the usual implements of this type
having no screw. It is tightened up by a very simple
chet gear built into the clip, and can be tightened to any
ent with the fingers alone. It is supplied in sizes to fit
ctically any size of hose at prices approximately equal to
se of the more usual screw clips.

PERSONAL NOTICES.

FORTHCOMING MARRIAGES.

HISMAN—HARRIS.—The marriage between Flt. Lt. L. Chisman
Miss Rosamund Harris will take place quietly at St. Thomas's
rch, Lymington, on Feb. 20.

LE-HAMILTON—FOX.—A marriage has been arranged between
Beresford Cole-Hamilton, Sq. Ldr., R.A.F., younger son of Mr.
Mrs. John Cole-Hamilton, of The Martyns, Salisbury, and Hilda
et Leslie Fox, younger daughter of Mr. and Mrs. C. Leslie Fox,
Rumwell Hall, Taunton.

cLOUGHLIN—DORMER.—The marriage arranged between Flt. Lt.
T. McLoughlin and Miss Ferdinande Dormer will take place
he Brompton Oratory on Feb. 20.

PE—YOUNG.—The engagement is announced between Flt. Lt.
G. Pope, D.F.C., R.A.F., third son of the late Mr. and Mrs.
iam Pope, of Waterford, Ireland, and Pamela, elder daughter
r. and Mrs. A. Cameron Young, of Ipswich.

OODHOUSE—WILKES.—The marriage will take place next month
veen Sq. Ldr. John Whitaker Woodhouse, D.S.O., M.C., son of
Rev. J. T. and Mrs. Woodhouse, of Dorking, and Kathleen Eleanor
kes, daughter of Mr. David Wilkes, of Forest Hill.

BIRTHS.

ROWN.—On Feb. 2, at 16, Marchwood Crescent, Ealing, to Enid,
of E. A. J. Brown, late R.A.F.—a daughter.

IGHT.—On Jan. 8, in Trinidad, B.W.I., to Margaret, wife of
ald R. Wight, late of No. 111 Sqdn., R.A.F. (Ramleh, Palestine)—
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Brooklands Sporting Life Meeting	3 Firsts
Brooklands Surbiton M.C.R. Meeting	3 Firsts
Yorkshire Air Pageant	3 Firsts
Liverpool Civic Week	4 Firsts
Nottingham Meeting	2 Firsts
Newcastle Meeting	3 Firsts
Bournemouth Whitsun Meeting	3 Firsts
Hampshire Air Pageant	2 Firsts
Bournemouth Easter Meeting	3 Firsts

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THE MIDDLE COURSE.—II.

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Edited by C. G. Grey

Vol. XXXIV. No. 7. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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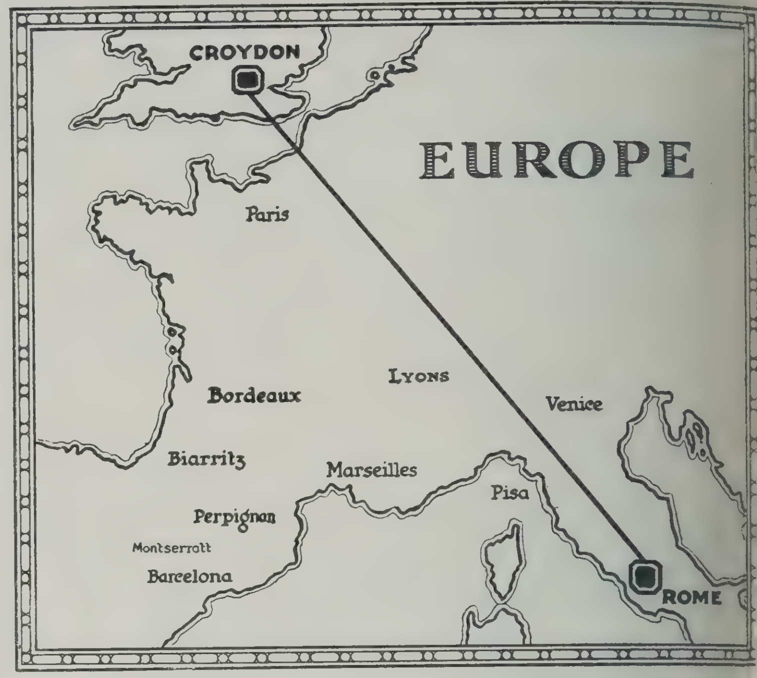

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FEB. 15, 1928.

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Incorporating Aeronautical Engineering

VOL. XXXIV. No. 7.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON THE SAFETY OF THE MIDDLE COURSE.—II.

ast week one pointed out that just as the American auto- bile manufacturer has captured practically the whole of overseas market and a large portion of the English rket by taking the middle course and supplying a power- , reliable, commodious and well-equipped, if roughly- lt, car in a class between our highly expensive luxury- s and our very refined but too small cars, so the British craft manufacturer, unless he takes the necessary steps nediately, is likely to see the American aircraft manufac- ers capturing the world's market with a good, sound, dium-powered passenger-carrying machine in the middle ss between our superlatively good and high-priced war chines and our excellent and necessarily high-priced it aeroplanes.

herefore we may now turn to the consideration in detail Mr. C. R. Fairey's arguments for the policy of the British nufacturer.

A Practical Policy.

ne has never had any intention of attacking the policy which British aircraft manufacturers have acted up to present moment. Hitherto the R.A.F. and foreign ernments have been the only market, and war-machines only saleable aircraft. The market for light aeroplanes grown recently, and we have captured practically all it. What one has been doing for the past few months trying to point out to the Trade the policy which they st follow in the immediate future if they are not going suffer the fate of the Cycle Trade and the Motor Trade in past.

r. Fairey has evidently misunderstood one's line of ument when he suggests that according to The Aeroplane ll the Industry really have to do is to make an imitation erican monoplane, fit it with a Wright Whirlwind 200 . engine and proceed to capture the World's market i it in competition with its American prototype"—add- , "although what benefit this would be to the British ine manufactuer is not made clear."

ne certainly has suggested that in the absence of a ish engine to do just what the Whirlwind has done ish manufacturers would do well to build passenger- ying machines in the same class as the successful erican monoplanes and buy Wright Whirlwinds for them. nybody had done so one would naturally assume that, g British constructors, they would have produced machines of better finish, and with a higher performance, than the American machines.

There ought to be no difficulty in doing so. Wages in England are lower than they are in the States, the average individual English worker is a better workman and less of a machine-minder than is the average American. And, as the American constructor of commercial aircraft has not yet reached the mass production stage, but is just as much dependent on handicraftsmanship as we here, the English constructor can meet him on level terms—for the present.

Also, advertising in the World's markets is cheaper for the British manufacturer than it is for the Americans. The advertisement rates of the English aircraft papers are far below those of the American papers, and the English papers are, one believes, more widely and more carefully read in the Overseas Dominions than are the American papers.

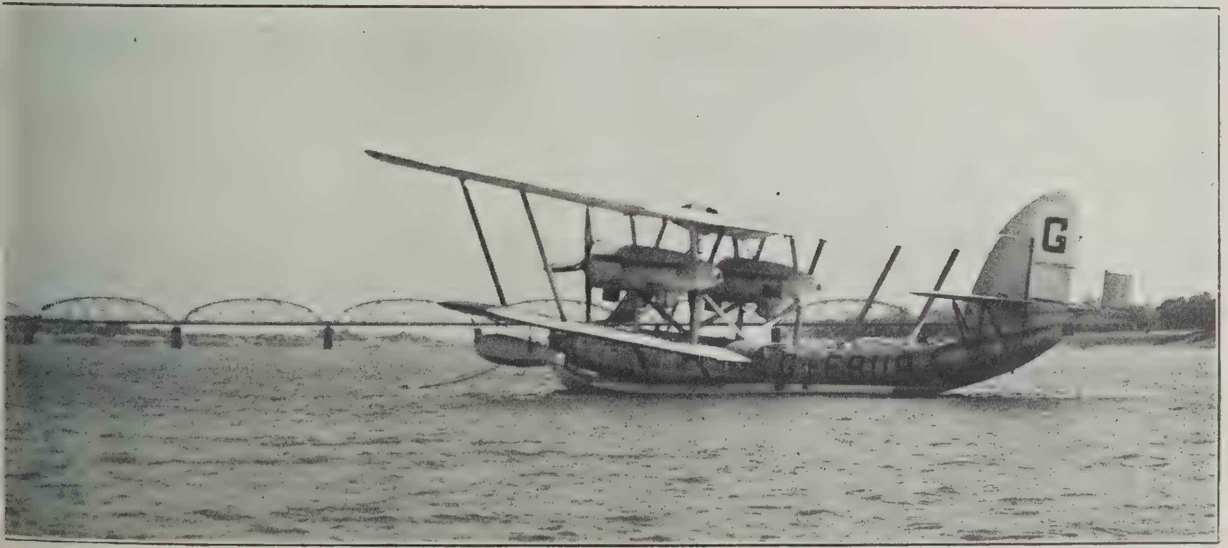
Consequently we ought to be able to build here either a cheaper machine of the same quality or a better machine at the same price. And, so far as performance is concerned, we ought to have no difficulty in producing a cleaned-up machine more or less on the lines of the American monoplane in the 200 h.p. class which would be considerably faster and probably have a better climb, now that we have been taught how to do it—thanks very largely to Mr. Fairey's own recent types.

The Engine Question.

Since one made those suggestions the Armstrong-Siddeley Lynx engine has been improved so that it now actually gives more power than the Wright Whirlwind. Moreover, recent experiences with the Lynx in the Royal Air Force, and recent performances of that engine—notably that extraordinary voyage from Amsterdam to Batavia and back on a Fokker monoplane with three Lynx engines—have proved quite definitely that the Lynx is the best engine in the World in the 200 h.p. class for reliability and handiness.

Furthermore, the Lynx engine is now actually cheaper than the Whirlwind, besides being more powerful. And it is lighter than the Whirlwind. So what are our aircraft constructors going to do about it?

Before the Lynx engine was developed to its present stage of efficiency and reliability we had no engine to compete with the Whirlwind. Therefore one was concerned solely with the welfare of the aircraft constructors.



ON THE NILE.—The Short Singapore (two 650 h.p. Rolls-Royce Condor engines) on which Sir Alan Cobham is making a survey flight round Africa, moored out on the Nile at Khartum, near the new bridge.

If we happen to lack an engine in a certain class which is necessary for a certain class of aeroplane, surely the aircraft constructor cannot be expected to lose that market simply out of consideration for the feelings of the British engine manufacturer. But now we have the Lynx. Also, we are likely to have within a very few months an 8-cylinder "V" version of the de Havilland engine, which has done so well in the Tiger-Moth. And that ought to fit nicely into a streamlined fuselage. Therefore, on the whole, we are now in a position to compete directly with America in the 200 h.p. five-seater class.

THE AMERICAN TYPES.

Whether machines in this class need necessarily be monoplanes or not is a matter for the aircraft designer to decide. But somehow a monoplane does seem to give the designer a better chance of reducing head resistance. And it certainly does give passengers a better view. And it gives handier ways of arranging for doors and cargo space.

If anybody can produce a cleaned-up biplane which will give a better performance than a monoplane with the same load and the same power, so much the better. A biplane is certainly handier to store. It is easier to handle on the ground, whether taxying or being man-handled. And it undoubtedly seems to land more slowly and get off more quickly, owing to the lower wings being close to the ground.

Admittedly the various American monoplanes have got a lot of advertisement out of the trans-Atlantic flights, and these flights have been favoured by a following wind which put their natural cruising speed up to a very high travelling speed. But there is no getting away from the fact that four years ago the Bellanca had a top speed of 135 miles an hour with four passengers and pilot and enough petrol for any ordinary air-line stage—though, of course, not enough for the Atlantic crossing.

One quite agrees with Mr. Fairey that the sales of the small sizes of civil aircraft in America are largely due to the use of the old Curtiss OX engine, which so far has been bought at Government disposal prices, or even at the price of scrap-iron. But one is not so much concerned about the enormous sales of these small machines as one is with the quite respectable business which is being done in the 200 h.p. class, in spite of the fact that the price of the Whirlwind is actually higher than the price of the Lynx.

Owing to the fact that we have neglected the 200 h.p. five-seater, we now find ourselves in the curious position of having a better and cheaper engine than the Americans have, and yet not having a single air-transport machine in which it is used.

AIR TRANSPORT CONDITIONS.

Also, one agrees that the Continent of America is excellently suited for flying. In spite of its vast extent there are practically no mountains between the Arctic Circle and the Mexican Frontier which need trouble a decent aeroplane of 200 h.p., with the exception of the Rockies, and they are all on one side, so that there is plenty of room in the rest of the Continent. And, outside the comparatively uninhabited forest areas, practically the whole country is one vast landing ground. Therefore there must necessarily be quicker development in air transport in the States than there is likely to be in this country.

That, in fact, ought to be our salvation. For while the Americans are filling up their own growing market we have the opportunity of profiting by their experience, building better aeroplanes, and capturing the markets in our own Overseas Dominions and in such parts of South America and the rest of the World as are likely to buy aeroplanes at all.

But we have got to set about it now and not wait, as we did in the Automobile Trade, until the Americans have filled their own market and have started dumping their over-production in our Dominions.

One disagrees entirely from Mr. Fairey in his statement that we cannot expect much flying in this country because of our climate, our excellent rail and road communications and our lack of aerodromes. Our climate is little, if any, worse than the climate in the Northern States, where most of the flying is done. One has seen fogs in America just as bad as anything in England, and considerably worse rain and wind. And we hardly ever have the blizzards which are a regular feature of every Winter in the Northern States and in Canada.

Certainly our railways are better than they are in the States. But our long-distance trains are nothing like as fast as they were twenty years ago. And, anyhow, there are many cross-country journeys which can be made by aeroplane in a quarter of the time they can be made by rail.

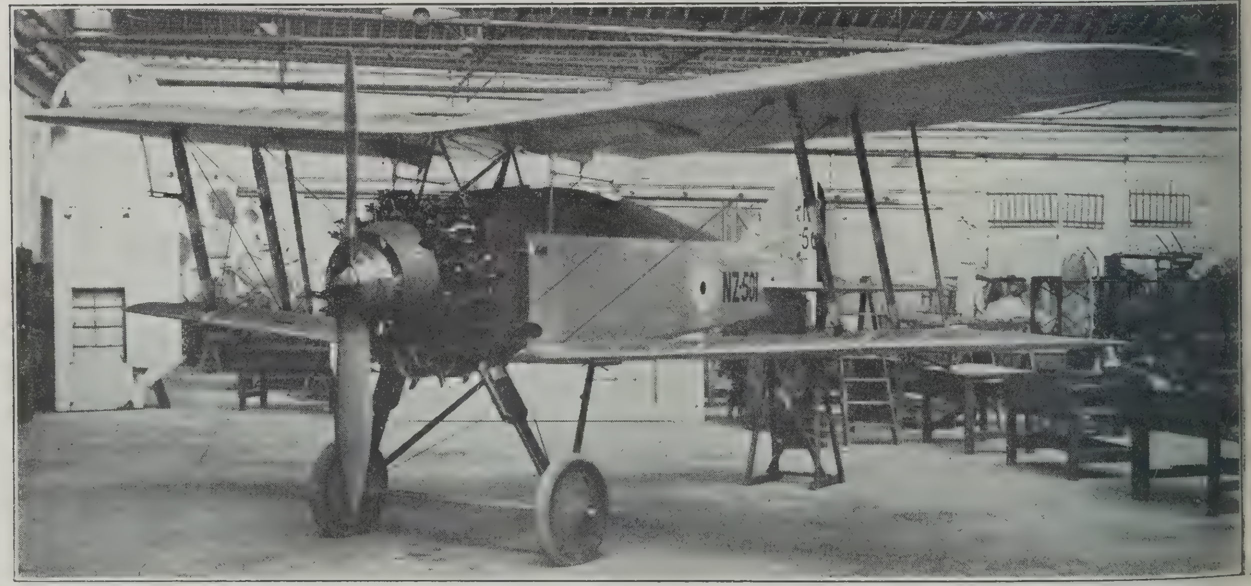
So far as roads are concerned, unless one drives between about 11 at night and 6 in the morning, anything like high speeds are impossible. On Saturdays and Sundays our roads are almost impassable, unless one is content to meander along at about 20 miles an hour, and even then at considerable risk from the masses of bad drivers who now infest the roads, thanks to the introduction of cheap cars.

This year and henceforth the roads will become steadily worse for high-speed travel. And before long everybody who can afford it, which means everybody who can now afford a £700 car, will adopt the de Havilland firm's advertisement slogan and "get off those crowded roads."

In spite of the high cost of land which Mr. Fairey mentions, the demand for aerodromes will create a supply of aerodromes. Twenty years ago nobody would have thought of taking one of the most expensive shops in the main street of a big town and turning it into a garage. The demand for garage accommodation would not have justified it. To-day garages have the best shops all over the country.

With the improvement of the control of aeroplanes below the stalling point (with consequent safety in getting off and landing), and other improvements which will come in due course, we shall be able to do with smaller aerodromes, and so we shall have our aerodromes nearer to the middle of our big cities. And even now country towns can afford, when they get to the stage of wanting municipal aerodromes, to buy ground for them within a few minutes of their centres.

Mr. Fairey refers to the restrictions under which private flying has in the past been bound up. Quite possibly some of our air regulations have hampered developments. But they have also saved a good many foolish people from breaking their necks. And in these days, there is nothing whatever about our air laws which need prevent any reasonable person from building, buying or flying reasonable aeroplanes at a reasonable price.



FOR NEW ZEALAND.—**The first Gloster Grebe (425 h.p. Armstrong-Siddeley Jaguar engine) to be supplied to the New Zealand Air Force. This machine differs from the standard Grebe in that it has the new type narrow chord ailerons, improved fuselage cowling, and an enhanced all-round performance.**

Thoroughness!

A few Napier Achievements.

Schneider Trophy, 1927. Winner, Supermarine-Napier with Napier engine. Average speed 281.669 m.p.h.

Cape to Cairo and back. Twice flown by four Fairey machines, each fitted with a Napier engine—100,000 engine miles.

Spain to Buenos Aires. Flown by Major Franco with a Dornier flying-boat fitted with two Napier engines. 6,259 miles in 59 hours.

THOROUGHNESS is the keynote in the construction of the Napier Lion engine. Every part—after every major operation—is tested and retested.

hat is one of the reasons why the Napier is so consistently reliable—why it has uch a splendid record of achievement.

he illustration shows one of the many processes in the manufacture of the Napier -the examination of the short stiff crankshaft after the two-hour bench test which *very* Napier engine undergoes after assembly.

very vital part in the construction of the Napier is examined with the same care efore being reassembled and given its final delivery test.

his is just one example of the very thorough methods employed in the making f the Napier Lion.

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Moreover, our restrictions have had the effect of increasing the reputation of our aeroplanes. A British airworthiness certificate is a hallmark which makes one of our machines worth more money than any foreign machine in the same class.

One disagrees from Mr. Fairey again when he says that our export figures "for this class of machine" probably exceed the American figures. One disagrees because as we happen to be discussing the 200 h.p. five-seater, there are no export figures. We have never built a machine of this class, and America has never exported any,—except for the few Fokkers and Fairchilds which have gone to Canada, and so far their money value is not worth counting, though their value in preparing the way for more American machines in Canada is considerable.

Certainly we have exported a vast quantity of Moths, besides certain Avians, Widgeons and Bluebirds. And thanks to them British manufacturers have established a very high reputation for the quality of our civil aeroplanes.

One might, for the purpose of argument, class the D.H.50 with the Whirlwind five-seaters, but the good old Puma engine hardly comes into the same category as a light air-cooled engine. And the performance of the D.H.50 which now is something like eight years old, is a good deal below 130 m.p.h. top speed. And that is the least any designer ought to consider if he is going for that market.

THE KEY TO THE POSITION.

The real key to the whole position is, as Mr. Fairey has very rightly said, that "the complicated resources that are necessary to the development of a modern service aircraft absolutely unfit a firm devoted to that end to compete in the commercial field for cheap machines." Mr. Fairey is quite correct in pointing out that in America, as in this country, the large aircraft firms who are Government contractors do not make or deal in small civil aircraft. To quote Mr. Fairey, such a firm "is not equipped for, and by its very nature is not likely to be able to compete in, the light aeroplane industry in the commercial field at competitive prices."

That is absolutely true, and that is exactly one of the difficulties we have to overcome if we are not going to let the American manufacturer of commercial aeroplanes capture our markets.

There are two ways out. One is for people who have had experience of aircraft building to get hold of enterprising capitalists who believe in the future of air transport, and to induce them to finance the building of real commercial aircraft. The other way is for the existing aircraft firms who have made fortunes out of building war machines to register subsidiary firms and to set up those firms in separate factories with an entirely separate staff to design commercial aeroplanes for cheap production, and to organise these factories for output on an ordinary commercial basis.

All the experience of aerodynamic design and of the strength of materials and so forth, which has been gained in the war-machine factories at colossal expense to the British tax-payer, can be put into these subsidiary commercial factories for nothing. There are in the war-machine factories plenty of brilliant young designers who have absorbed all the existing knowledge of aeronautical engineering from their seniors, and still have young and flexible brains which can think out methods of detail designs which are cheap to produce.

In their design work they would be entirely free from interference by Air Ministry technicians of the sort who are everlasting holding up the production of experimental machines because they want radiators altered, guns put in a different position, electric wiring made heavier, compasses displaced, wireless apparatus stowed differently, and so forth. To have their machines certified as airworthy they would only have to satisfy the Air Ministry's Stress Department and the Aeronautical Inspection Department—both of which are not only reasonable in their demands but are constantly keen to help with useful suggestions. In fact, anybody who has the gumption to co-operate skilfully with those two Departments can save a lot of money and get a great deal of valuable brain-work for nothing.

One has never suggested for a moment that cheap commercial aeroplanes can be built in war-machine factories with the enormously expensive designing staffs and production staffs which have to be maintained to meet Government requirements. Nor does one suggest that marketable commercial machines, apart from experimental light aeroplanes, can be built in a little wooden hut in a field. Here again we must take that middle course which is safe. Our commercial machine must be designed and built in small but properly equipped factories backed by reasonable capital.

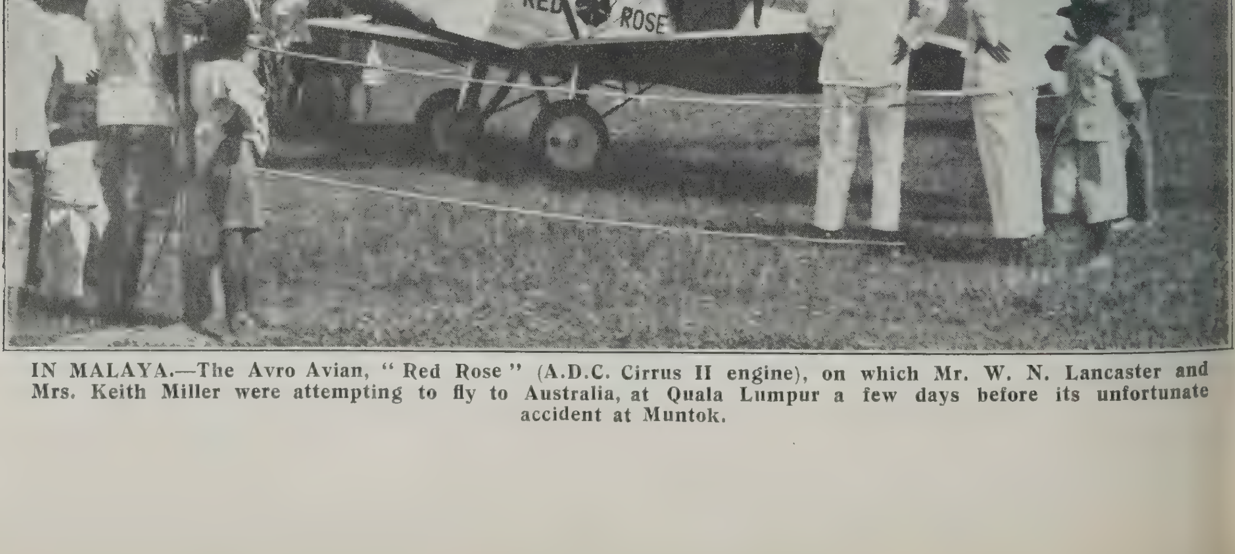
OUR SUCCESS.

Finally one quite agrees with Mr. Fairey in attributing the present happy state of this country—the best fed, the best clothed, and the best amused in the World—to the work of British Industrialists. But again that happy state of affairs is due to our pursuing the safe middle course.

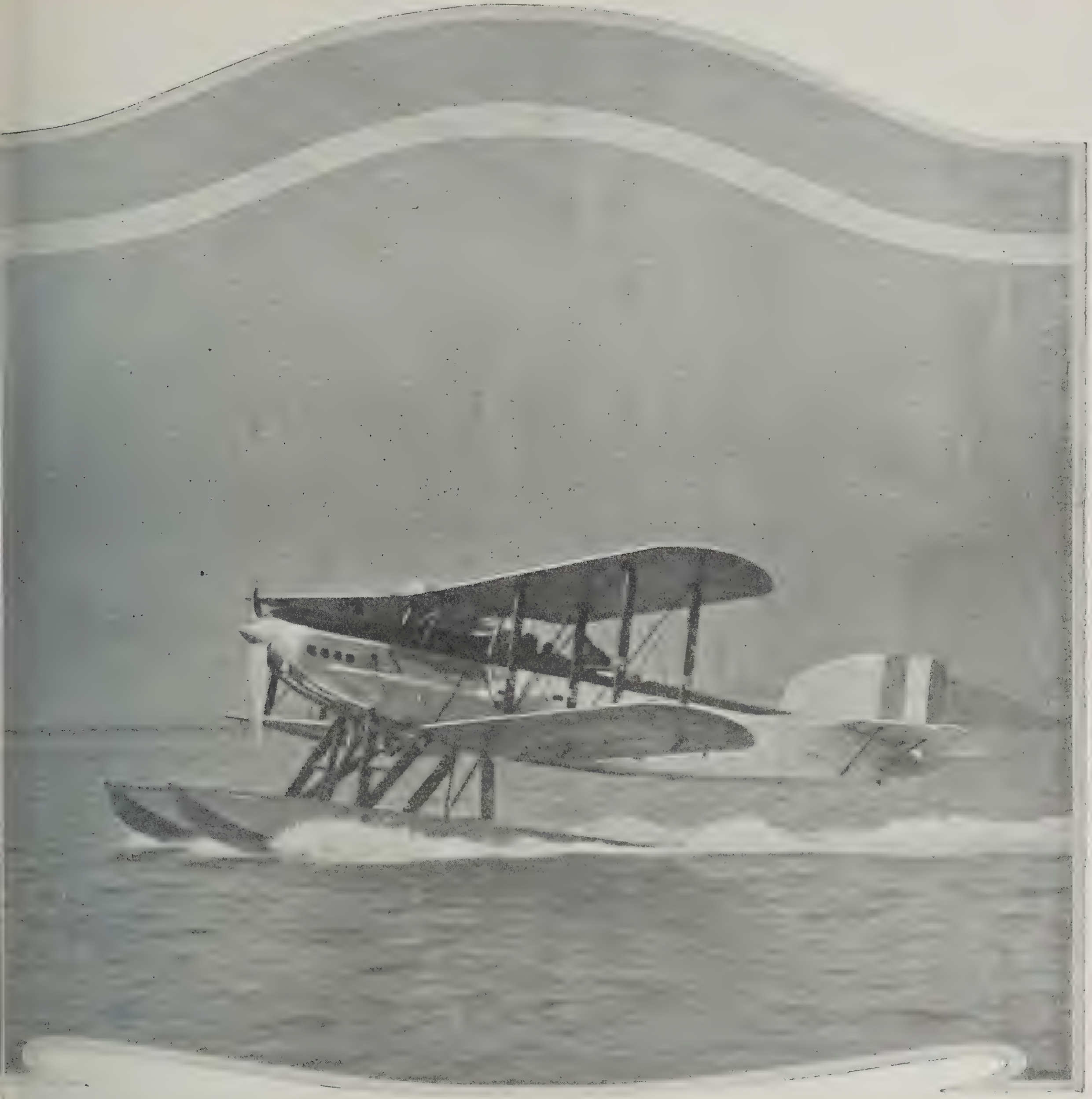
All the get-rich-quick schemes proposed by brilliant young men soon after the outbreak of Peace have crashed badly. Most of the stupid old conservative ultra-English manufacturers have died since then. And a great many badly-managed conservative industries, such as the Coal Industry, for example, and, to a great extent, the Cotton Trade, seem to be dying.

The big money is being made by sensible middle-aged business men who were still young when the War ended, and have opened up new industries, or, at any rate, have imported new methods to old industries. And it is just that kind of enterprise which we need in the Aircraft Industry.

Even our youngest aircraft industrialists are still depending on their output of war-machines in the old conservative way. So far that policy has paid them very well. But the big money is to be made very soon out of commercial aircraft for transport, mail-carrying, and air survey work. And for such work the type of machine we need is the plain middle-class commercial machine, which is not mentioned in Mr. Fairey's philosophy, though one has a suspicion that he and other active brains in the British Aircraft Industry have certainly dreamed of it. One hopes ere long to see them pursuing that middle way which will bring us all safely to fortune.—C. G. G.



IN MALAYA.—The Avro Avian, "Red Rose" (A.D.C. Cirrus II engine), on which Mr. W. N. Lancaster and Mrs. Keith Miller were attempting to fly to Australia, at Quala Lumpur a few days before its unfortunate accident at Muntok.



The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier " Lion " engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

THE OVERSEAS VIEW.

Those who still think that the constructive criticisms of the policy of British manufacturers in relation to overseas trade which have appeared in The Aeroplane during the past few months are not likely to help towards the Trade boom which is coming, are asked to read the following paragraph from a letter written on Jan. 4 by the manager of one of the most successful aircraft operating firms in Australia.

> "I must include thanks for your very excellent article on Overseas Trade, which appeared in your issue of Nov. 16. I feel that all Aircraft Operators in Australia owe their thanks to you for that very able article, and also the manufacturing people in England—if they will take any notice."

As a writer in *The Spectator* said, apropos our English attitude in general, when reviewing *All the World's Aircraft* on Jan. 7, "Self-confidence is sometimes a virtue, complacency is generally a crime."

There is every reason for our English manufacturers to be confident in the quality of our aircraft and our engines, and in the ability of our designers—if some of the younger men are given a chance. But, if suicide be a crime, then we are certainly criminally inclined so far as concerns our policy in the matter of the types of machines which we are ready to offer the overseas buyer. Still, there is yet time for a death-bed repentance, and a complete regeneration, if we act now instead of waiting till America has captured our market.

THE RELAY FLIGHT TO INDIA.

According to the gossip-writer in *The Evening News,* who generally has fairly good ground for his rumours, the Air Ministry is preparing for a high-speed flight to India somewhat on the lines suggested in The Aeroplane at the time of the failure of the last non-stop attempt.

The scheme seems to be an "All Red" flight, starting with a non-stop flight to Malta, thence to Egypt, and thence by the usual Baghdad—Basrah—Karachi route. The writer of the rumour says that the machines will maintain a speed of "over 100 miles an hour," and will have a range of 2,000 miles.

That scheme, if rightly reported, strikes one as being quite the wrong way to go about the job. Of course the "All Red Route" idea sounds well, just to catch the eye or ear of what Kipling has called "jelly-bellied flag-flappers." But as a practical proposition it is not worth considering.

Nobody wants to travel non-stop from London to Malta,—something nearer 2,000 than 1,000 miles. And even 1,000 miles is too long a stage to be flown non-stop by any machine, either passenger-carrier or mail-carrier,—at any rate until engines and aeroplanes are much more reliable than they are at present.

Furthermore the job is not worth doing at all unless the relay machines can average well over 150 miles an hour. Lieut. Maughan, U.S. Army Air Service, flew from the Atlantic to the Pacific, all by himself, with the same machine and engine, between dawn and dark, at that speed, years and years ago, so there is no sense in doing the Indian journey at less speed with relays of machines and pilots. And the U.S. Trans-Continental Air Mail, averages 100 miles an hour on its 3,000-mile run every day and night. So, unless we can put up a really good show, with 200 m.p.h. at least, let us leave it alone.

So far as the "Malta non-stop" idea is concerned it is merely silly. Either France is a friend or an enemy. If France is to be looked on as a friend then let us arrange to use a French aerodrome as an intermediate stage. Four hours per stage is enough for anybody. At 200 m.p.hr. that would mean getting to about Marseille.

If France is to be considered an enemy, then obviously we can't send mail machines, let alone passengers, across France.—So that's that, as far as a potential air line is concerned. And if the projected flight is to be done only once, simply as a stunt, then there should be no difficulty in getting the consent of the French to putting a relay machine at Marseille.

In any case the 2,000-mile non-stop machine is a useless freak, at present. And this flight would be done with aircraft which if not absolutely normal are at any rate only boosted a trifle.—C. G. G.

THE WORLD'S SPEED RECORD.

Published rumour has it that some time early in March Flt. Lt. Kinkead and one of the Supermarine S.5s, which were built for the Schneider Trophy Contest,—now fitted with a Napier Lion which has acquired some extra horses,—are to go for the World's Speed Record in the neighbourhood of Calshot. And about time too.

Why we did not capture that record the day after the Schneider Contest is one of those things which, like the sinking of food ships during the War 1914-18, can only explained by the British Navy's constitutional objection using aircraft at the right time in the right way.

Still, better late than never, and although our good frien and gallant competitors the Italian Regia Aeronautica d go for and get the World's Record—by the excellent piloti of Major Bernardi—we can still have the satisfaction being the first to put the record over 300 m.p.hr.

The question is what the figure will be. There seem be opportunities for sweepstakes on any speed between 3 and 325 m.p.hr.—C. G. G.

SIR PHILIP SASSOON ON AIR POLICY.

In the course of an address to the Oxford University Co servative Association at Oxford on Feb. 10 Sir Phil Sassoon, Under-Secretary of State for Air, said that progre in speed of flight had been no less remarkable than certainty and range. The experimental machine known the Beardmore Inflexible had the colossal span of 50 yar or so, and troop-carriers capable of transporting 20 infantr men and their kit formed uncommonly useful adjuncts our military forces in the Near East.

Speed, climb and manœuvrability were necessary for figl ing, and size, power and range for bombing. In both dire tions research and exploration were continually going and only the factor of safety was somewhat neglecte Safety first, a doubtful sort of maxim even in peace-ti found very little place in war.

At the end of the war Great Britain had the most pow ful Air Force in existence. To-day we were content to ha what we believed to be the most efficient Air Force in world, and one which we hoped, when it was raised to f establishment, would be sufficient for our needs. We adopted as the guiding principles of our military air pol a sort of half-way house between the principles by wh the size of the Navy was controlled and those wh governed the size of our Army. We had accepted as a gu to the size of our Air Forces such strength as should sufficient to make the strongest air Power within strik distance of our shores hesitate to attack us.

Behind this highly efficient professional force we w endeavouring to provide a territorial organisation whi when need arose, would enable our national air streng to be rapidly expanded and adequately maintained. He glad to see that greater opportunities for learning to were now being given to the University, and he had doubt that full advantages would be taken of the facilities.

The existence of a really efficient force of bombing a planes known to be manned by resolute pilots must alw exercise a powerful restraint upon the warlike ambiti of a nation within range of the activities of that force, e though the nation in question had a more numerous fleet.

He did not think that anyone in this country would wish to revert to the old arrangement under which their forces formed part of the Army and the Navy, with no specially responsible for the development of air strateg the control and direction of air investigation and supply

AN ATLANTIC AIRSHIP SERVICE.

The United States Government is showing genuine terest in the project outlined by Commander C. D. Bur R.N. (retired), for a Transatlantic Airship Service.

Commander Burney, who is at present in the Un States, has called on President Coolidge, and he has several conferences with Mr. Hoover, the Secretary Commerce.

It is proposed to make an experimental return fligh the United States in September of this year with R.100, if this is successful steps will be taken to form an An American company. Every assistance will be given by U.S. Government to this flight, and the mooring mas the U.S. Naval airship station at Lakehurst, N.J., has placed at the disposal of Commander Burney, after w a permanent field in the hands of the company to formed will be necessary.

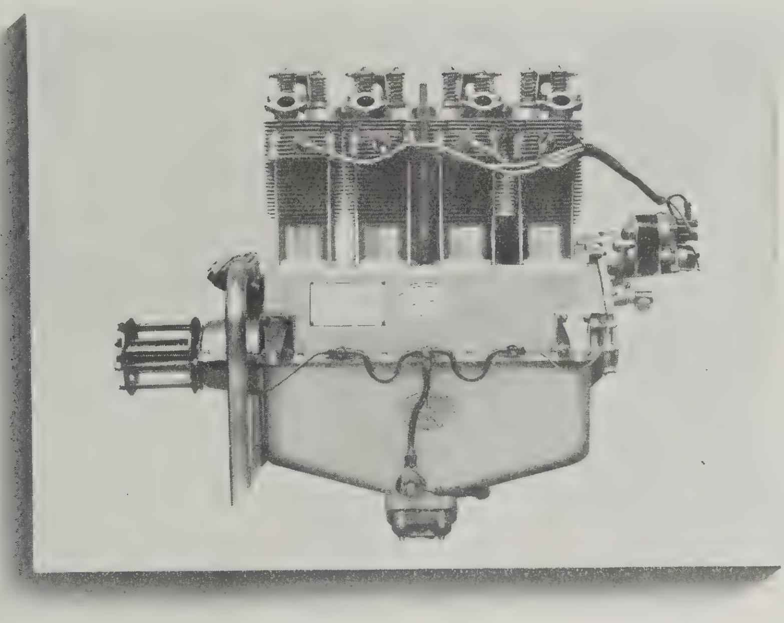
The Anglo-American venture calls for the operatio five passenger-carrying airships, two of which will be in the United States. It is reported that legislation w would ensure the use of airships for the carrying of ma to be considered by U.S. Congress.

THE ROYAL AERO CLUB MONTHLY HOU DINNER.

The Royal Aero Club will hold a Monthly House Di on Wednesday, Feb. 29, at 7.30 p.m. Lord Thomson preside, and Rear-Admiral Murray F. Sueter, M.P., will a discussion on "The Influence of Aircraft on Naval Strate The accommodation is limited to 60 and members are th fore requested to make early application. Morning dress be worn.

CIRRUS ENGINE

THE A.D.C. "CIRRUS" AERO ENGINE



Extract from:

The Times, Engineering Supplement, January 7th, 1928.

" In most cases the power unit in these aircraft has been the CIRRUS air-cooled four-cylinder-in-line engine, and it is no exaggeration to say that **this engine** has not only **made the Light Aeroplane of to-day possible,** but has established an unquestioned reputation for reliability, low maintenance costs and capacity to run for long periods with little more attention than a motorist gives to his car engine."

Manufactured by

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Constructors of "MARTINSYDE" Types of Aircraft.

PARIS—NEW YORK.

On Feb. 11 MM. Costes and Le Brix arrived at Mitchel Field, Long Island, N.Y., on their Breguet XIX biplane (500 h.p. Hispano-Suiza engine), thus completing their 25,000-mile journey from Paris by way of West Africa, the South Atlantic and South and Central America.

They were met by the French Consul-General, the Commanding Officer of Mitchel Field, a representative of the Mayor of New York, and a number of prominent aviators and they were later driven to New York for a lunch given in their honour by the French Chamber of Commerce.

To MM. Costes and Le Brix belongs the honour of landing the first European aeroplane in New York after having flown from Paris. Although their arrival did not arouse one-hundredth of the enthusiasm that a direct flight across the Atlantic would have done, this flight must certainly rank as one of the finest of recent years.

The actual machine used was completed on June 15, 1926, and was tested by M. Costes in his capacity as chief pilot of the Breguet company.

Since then this identical machine has been used in four attempts to beat the World's Record for Flight in a straight line, and on two of these occasions it succeeded in breaking the record.

On July 14-15, flown by Capt. Girier and Lieut. Dordilly, it flew from Paris to Omsk, a distance of 2,918 miles, in 27 hours non-stop.

On Oct. 28-29, this time flown by M. Costes and Capt. Riguot, it beat its previous record by flying from Paris to Jask, a distance of 3,508 miles, in 32 hours non-stop.

Altogether, before it left Paris on Oct. 10, 1927, on the flight which has just been completed, it had flown a total of 37,260 miles in 300 flying hours without any mishap.

With the completion of the present flight the machine has now covered about 62,000 miles in over 500 flying hours—a very creditable record for a machine that has done so much flying in an overloaded state such as is required for present long-distance record attempts.

The Hispano-Suiza engine had run a total of 250 hours before it started on the flight to the Americas, and has given not trouble throughout its life.

THE AEROPLANE offers congratulations to MM. Costes and Le Brix, the Breguet and the Hispano-Suiza companies, on the successful conclusion of a very noteworthy performance.

MR. HINKLER'S TRIP.

Mr. Bert Hinkler, whose departure from Croydon for Australia on Feb. 7 was recorded in last week's issue of THE AEROPLANE, reached Rome on the evening of that same day. This flight of a little over 1,100 miles is one which has never before been made without intermediate landing.

On Feb. 8 Mr. Hinkler flew from Rome to Malta, taking just over six hours for a journey of 500 miles.

On Feb. 9 he flew from Malta to Tobruk (Cyrenaica). His movements on Feb. 10 are so far unrecorded but o Feb. 11 he arrived at Ramleh, Palestine.

On Feb. 12 he flew from Ramleh to Basrah, a distance o 950 miles, in 9½ hours non-stop.

On Feb. 13 Mr. Hinkler left Basrah to fly down th Persian Gulf, to Jask.

On Feb. 14 he left Jask at 02.30 hrs. and arrived at Karach at 15.30 hrs.

The completion of the first stage of his flight to Karachi a distance of approximately 5,000 miles, in seven days, is b far the finest achievement in long-distance flying that ha been made.

The ability of Mr. Hinkler to carry through with anythin he sets out to do has already been demonstrated, so that ever confidence is felt that his present flight, so brilliantly started will be brought to a successful conclusion.

A FRENCH FIGHTER COMPETITION.

The *Service Technique et Industriel de l'Aéronautique* i at present holding a competition for single-seat fighter aircraft of the class known as the "type *Jockey*."

Five types of machines are competing, i.e., Nieuport, Morane-Saulnier, Bleriot-Spad, Wibault and S.E.C.M., all o which are fitted with either the 400 h.p. or 500 h.p. Hispano-Suiza engine.

GENET-MOTHS FOR CANADA.

The Royal Canadian Air Force has ordered two D.H Moths (Armstrong-Siddeley Genet engines) which are to b used for training purposes at Camp Borden.

THE LAUNCH OF THE SHORT CALCUTTA.

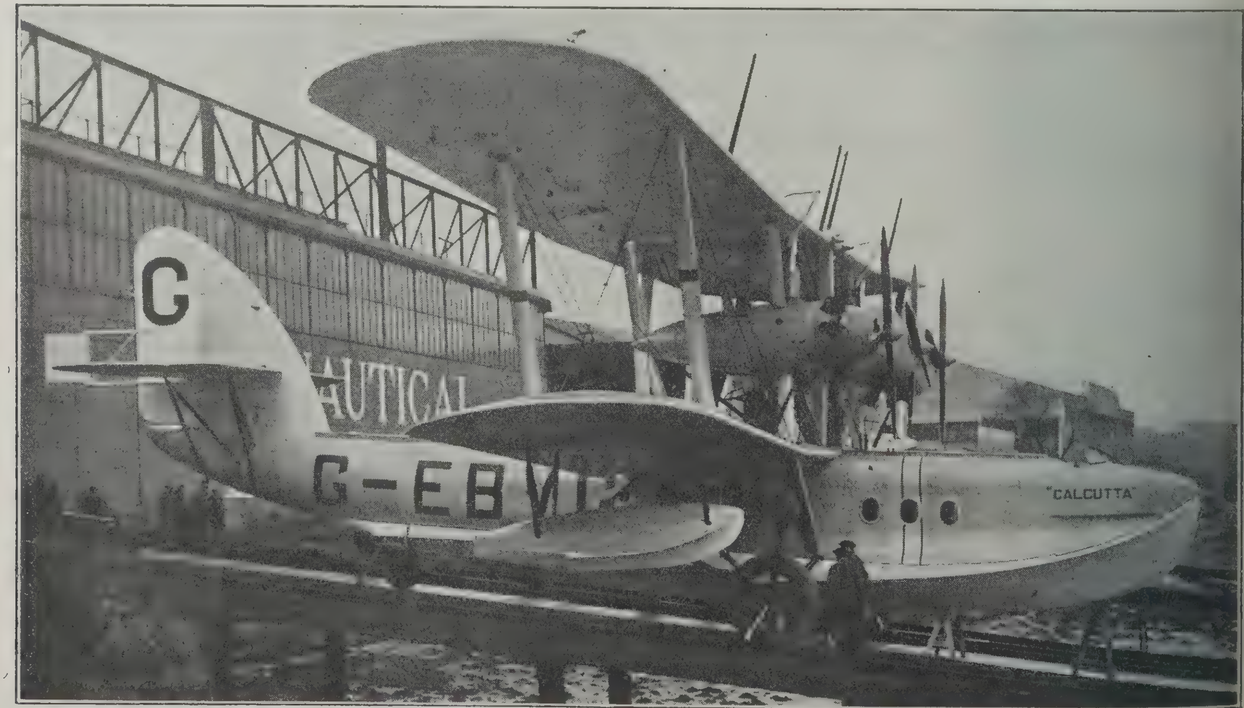
The first of the Calcutta type of commercial flying-boats, designed and built by Short Bros. Ltd., to the order of the Air Ministry, was launched from the maker's works a Rochester on the afternoon of Monday, Feb. 13, and was ceremonially christened with the aid of the traditional bottle of champagne by Mrs. F. A. Matthews, Mayoress of Rochester. This machine is the first all-metal flying-boat designed expressly for civil purposes to be built in Britain.

Two of these machines are on order, and they are to be handed over to Imperial Airways for experimental operation on a route yet to be declared.

A general description of the Calcutta type was published in THE AEROPLANE for Jan. 12, 1927. This original description in general remains fairly accurate. The Calcutta is a development of the Singapore type—now being used by Sir Alan Cobham on his African flight.

It differs from the Singapore in that it has three Bristol Jupiter air-cooled engines in place of the two Rolls-Royce Condor engines, and in being equipped primarily for the carriage of passengers.

A complete description of the Calcutta in the present form, covering details of construction and equipment, wil be published in next week's issue of THE AEROPLANE.



THE SHORT CALCUTTA.—The fifteen-passenger all-metal commercial flying-boat (three Bristol Jupiter VIII engines) before its launch at the works of Short Bros. Ltd. at Rochester on Feb. 13.—(*"Aeroplane" photograph.*)

ONE A DAY!

——This is the present rate of production of the Moth and every working day of the week a new machine—perhaps with wheels, perhaps with floats or skis—leaves Stag Lane for some corner of the globe. Without referring to the many successes and achievements of the Cirrus engined Moth during the past three years and avoiding the use of extravagant adjectives such as SUPREME, IDEAL, PREMIER or BEST, we respectfully invite an appreciation of the significance which lies behind a demand justifying this production rate.

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THE ROYAL AIR FORCE.

The London Gazette.

Feb. 7.

General Duties Branch.—Flg. Off. (now Flt. Lt.) R. H. Horniman is granted a perm. comn. (Nov. 1, 1927); Sq. Ldr. J. J. Breen is placed on the half-pay list, scale B (Feb. 6).

Stores Branch.—Flt. Lt. G. Baker is placed on the half-pay list, scale B (Feb. 1).

Accountant Branch.—Plt. Off. on probation R. S. Sweet is confirmed in rank and promoted to the rank of Flg. Off. (Dec. 4, 1927).

Medical Branch.—The following Flg. Offs. are promoted to the rank of Flt. Lt. (Feb. 1):—G. E. Church, M.B., E. J. Jenkins. Flt. Lt. G. J. Griffiths is transferred to the Reserve, Class D.ii (Feb. 11).

Reserve of Air Force Officers.—General Duties Branch.—Flt. Lt. A. E. Woodbridge ceases to be employed with the Regular Air Force (Feb. 1); Plt. Off. I. C. Horton is promoted to the rank of Flg. Off. (Feb. 4).

The following Flg. Offs. are transferred from Class A to Class C:—T. Brewin (Oct. 24, 1927); D. P. Cameron, M.B.E. (Feb. 7). Flg. Off. H. G. Herbert relinquishes his comn. on completion of service (Sept. 18, 1927).

Auxiliary Air Force.—Chaplains Branch.—The following to be Chaplain with the relative rank of Sq. Ldr.:—No. 603 City of Glasgow (Bombing) Sqdn.—The Rev. W. B. C. Buchanan (Feb. 7).

Appointments.

Week ending Feb. 13

General Duties Branch.—Wing Commander V. S. Brown, to Cambridge University Air Squadron, for duty as Chief Instructor, 1/2.

Squadron Leaders A. G. Jones-Williams, M.C., to No. 23 Sqdn., Kenley, 21/1. V. R. Scriven, A.F.C., to R.A.F. Base, Gosport, 23/1.

Flight Lieutenants J. S. Harrison, to R.A.F. Base, Gosport, 11/2. W. Elliot, to No. 207 Sqdn., Eastchurch, 23/1. H. N. Thornton, to No. 601 County of London (B) Sqdn., Hendon, 1/2. C. Porri, to Air Ministry, Directorate of Operations and Intelligence, 2/12. A. H. Love, to No. 2 Sqdn., Manston, 4/2.

Flying Officer L. H. Ross, to No. 43 Sqdn., Tangmere, 17/2.

Pilot Officers R. F. Part, to No. 12 Sqdn., Andover, 27/1. N. A. Pearce, to No. 1 F.T.S., Netheravon, 15/3. C. Stephenson, to No. 2 F.T.S., Digby, 30/1. A. M. Butt, to No. 100 Sqdn., Bicester, 8/2. C. H. Hookly, to No. 13 Sqdn., Andover, 9/2.

Medical Branch.—Flight Lieutenant (Dental) R. G. J. Charlesworth, to R.A.F. Depot, Uxbridge, on appointment to a Temp. Comn., 9/1, and to Station H.Q. and Storage Section, Andover, 6/2.

Flying Officer D. A. Wilson, to R.A.F. Station, Bicester, 29/1. Flying Officer (Q.Mstr. Medical) P. H. Musgrave, to H.Q., 'Iraq, 27/1. The undermentioned Flying Officers are posted to the Medical Training Depot, Halton, on appointment to S.S. Comns. with effect from 2/2:—J. Kemp, M.B., B. B. Kennedy, M.B., J. J. MacAndrews, M.B., R. F. MacLatchy, M.D., J. B. Murphy, M.B., J. C. Neely, B.A., F. A. O'Connor, M.B., L. O'Connor, M.B., and J. J. Quinlan, M.B.

Stores Branch.—Flight Lieutenant A. M. Saywood, to No. 1 Stores Depot, Kidbrooke, 6/2.

Accountant Branch.—Flying Officer E. C. Green, to H.Q., Cranwell, 6/2.

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident near Emsworth, Hants, to a Gamecock machine of No. 43 (Fighter) Squadron, Tangmere, on Feb. 8, Plt. Off. Peter John Basil Chalmers, the pilot and sole occupant of the aircraft, was killed.

The Squadrons for India.

The two new Squadrons which are to be added to the R.A.F. establishment in India during the present year are to be drawn from the establishment of the Wessex Bombing Area as complete units and replaced by new Squadrons in that Area.

The Squadrons for India are to be No. 11 (Bombing) Squadron and No. 39 (Bombing) Squadron. No. 11 Squadron is stationed at Netheravon and equipped with Hawker Horsleys and commanded by Sq. Ldr. P. H. Cummings, D.F.C. No. 39 Squadron is stationed at Spittlegate, and equipped with D.H.9as and commanded by Sq. Ldr. H. V. Champion de Crespigny, M.C., D.F.C.

It seems unlikely that No. 39 Squadron will go to India with its present equipment and it may therefore be assumed that this Squadron will be re-equipped either with Fairey III.Fs or Westland Wapitis.

The 1928 Cairo—Cape Town Flight.

The annual Service flight from Cairo to Cape Town and back which is now a regular part of the Service exercises of the Middle East Command will begin on Mar. 1 and reach Cape Town about Mar. 25. The itinerary of the flight includes a stay at Nairobi where the machines will co-operate with the King's African Rifles.

A Flight of the South African Air Force will accompany the R.A.F. Flight from Cape Town to Khartum on the return journey, and after a stay at Khartum will fly back to Cape Town.

The equipment of the Flight will be Fairey III.Fs (Napier Lion engines).

Short Service Commissions.

The Air Ministry announces that nearly 350 officers be required by the Royal Air Force for Flying duties duri the present year under the short service commission schen the average rate of appointment being approximately 40 ea month. Applications are accordingly invited from suita candidates who must be between the ages of 18 and 25, w educated and of good eyesight and physique.

Wing Commander G. R. Bromet.

Wing Cdr. G. R. Bromet, D.S.O., O.B.E., *p.s.a.*, wh appointment to the R.A.F. Depot, Uxbridge, is dated Jan. was born in 1891 at Tadcaster and educated at Bradfi College, Osborne and Dartmouth. He entered the R Navy in 1912 and was attached to the Naval Wing, R.F. in May, 1914. He learned to fly on a Bristol biplane Salisbury Plain and at Brooklands, and his Royal Aero C Certificate No. 714 is dated Dec. 22, 1913. He was promo Lieutenant, R.N., in May, 1914, and appointed Fli Lieutenant, R.N.A.S., in July, 1914. He was promo Squadron Commander in June, 1916, and during the Ba of the Somme in 1916 he was placed in command o squadron of fighting aeroplanes which was detached fr the R.N.A.S. at Dunkirk for temporary duty with the Ar The squadron consisted of six two-seat Sopwiths, six sin seat Sopwiths and six Nieuport Scouts and they arri at Vert Galand Aerodrome in October, 1916. This squad continued to operate with the Army in France. *The Lon Gazette* of May 12, 1917, announced the appointment of Sq ron Commander Bromet to be a Companion of the Dis guished Service Order in the following words:—

> This officer commanded a squadron of the R.N.A.S. attached to Royal Flying Corps, with conspicuous ability and success. Under command the squadron developed into a most efficient and formid fighting force, which has brought great credit to the R.N.A.S.

After the Armistice he was posted to Coastal Area H.Q. Air Staff duties (liaison with the Admiralty) and in 1921 was promoted to the rank of Wing Commander and pointed to command the School of Naval Co-operation Aerial Navigation at Calshot. In 1923 he underwent a course at the R.A.F. Staff College, Andover, and in 1924, he was appointed Fleet Aviation Officer to the mander-in-Chief, Mediterranean Fleet.

Squadron Leader Keith.

Sq. Ldr. C. H. Keith whose appointment to command N (Army Co-operation) Squadron, 'Iraq, is dated Jan. was born in Canada in 1890 and educated at St. Lawr College. He was appointed to a temporary commission in R.N.V.R. in August, 1915, and transferred to the R.N. in September, 1916. He served afloat from November, to April, 1918, and with the R.A.F. in France from A 1918 to the Armistice. In 1921 he underwent a cours Naval Co-operation and Air Navigation at Calshot and there was posted to No. 230 Squadron at Felixstowe. April, 1922, he was appointed to the staff of the R. Cadet College, Cranwell, and in 1924 he was appoint the R.A.F. Staff College at Andover for a course. He promoted to the rank of Sq. Ldr. in July, 1924, and po to the Armament and Gunnery School, Eastchurch. September, 1926, he was appointed to No. 70 Squad Hinaidi, 'Iraq.

Squadron Leader Jones-Williams.

Sq. Ldr. A. G. Jones-Williams, M.C., whose appoint to command No. 23 (Fighter) Squadron is dated Jan. 21, born in Vernon, British Columbia, in 1898, and educate Haileybury and Sandhurst. He entered The Welch Regi in August, 1916, and was seconded to the R.F.C. in Jan 1917. He was appointed Flight Commander in May, and granted a permanent commission in the R.A.F August, 1919. He was awarded the Military Cross in 1917, for conspicuous gallantry and devotion to duty a bar to the Military Cross in September, 1917, for conspic gallantry. In 1919 he was appointed to the Flying Wi Cranwell, and in 1922 he was posted to No. 8 Squa 'Iraq. In 1926 he was restored to the Home Establish and posted to No. 100 Squadron. He was promoted to rank of Squadron Leader in January, 1928.

Sq. Ldr. Jones-Williams was the pilot of the Fairey machine in which Sir Philip Sassoon flew to Venice fo Schneider Trophy contest. He was also one of the R.A.F. Officers who accompanied Sir Philip Sassoon o recent trip to the United States.

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THE Eighteen Thousand Miles flight of the three Lynxes fitted in Lt. G. A. Koppen's Fokker definitely establishes the world-wide supremacy of these

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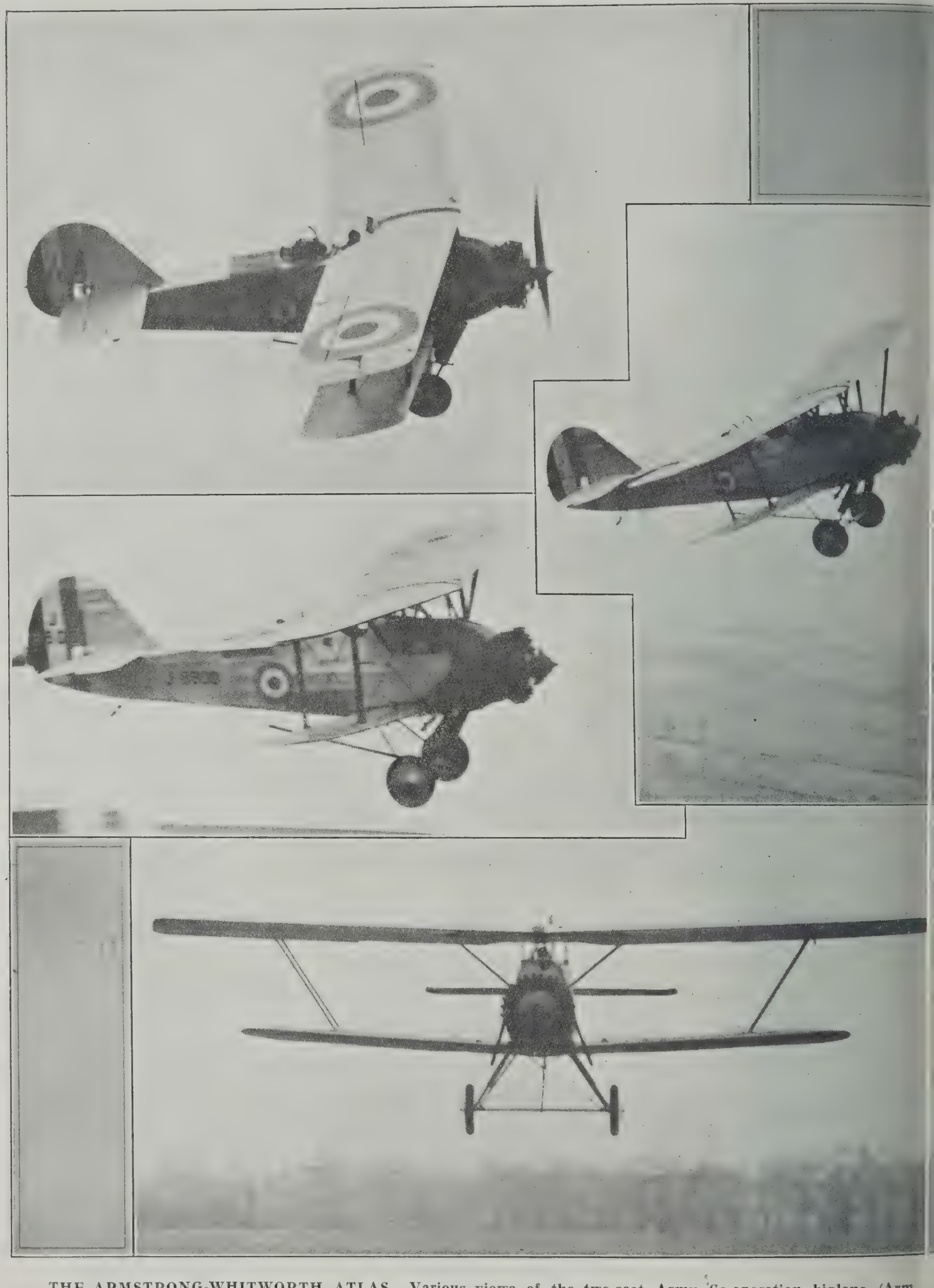

THE ARMSTRONG-WHITWORTH ATLAS.—Various views of the two-seat Army Co-operation biplane (Armstrong-Siddeley Jaguar engine) which is now in production as a replacement for the Bristol Fighter. The most notable features of this machine are all-steel construction and swept-back staggered wings. Its kinship with the Armstrong-Whitworth Siskin single-seat fighter, which forms part of the standard fighter equipment of the R.A.F., can clearly be seen. Nos. 13 and 26 (Army Co-operation) Squadrons, R.A.F., are already re-equipped with this machine.—(*"Aeroplane" photographs.*)

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ROLLS-ROYCE AERO ENGINES in a Handley-Page aeroplane flew from **ENGLAND** *to* **INDIA** *in* 1919.

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ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew from **ENGLAND** *to* **SOUTH AFRICA** *in* 1920.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew across the **SOUTH ATLANTIC** *in* 1922.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew **round AUSTRALIA** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Fokker monoplane flew from **HOLLAND** *to the* **EAST INDIES** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Handley-Page aeroplane flew from **BRUSSELS** *to the* **BELGIAN CONGO** *in* 1925.

ROLLS-ROYCE AERO ENGINES in Dornier-Wal flying boats flew from **MOROCCO** *to* **SPANISH WEST AFRICA** *in* 1926.

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The Fleet Air Arm.

The Times of Feb. 9 states :—

H.M.S. Vindictive, Capt. D. B. Le Mottee, has been ordered home from the China Station, where she has been serving as a unit of the Fifth Cruiser Squadron since 1925. She is expected at Devonport about the beginning of May, by which time three years will have expired since her present crew joined her at Chatham on Apr. 15, 1925. The *Vindictive* will be recommissioned for duty in the Second Cruiser Squadron in the Mediterranean Fleet, which squadron has hitherto been composed entirely of "C" class cruisers. She is a vessel of the Hawkins class, but during the War was completed as an aircraft carrier. Although reconditioned as a cruiser in 1924-25, she has only six 7.5 in. guns instead of the seven in her sister-ships, and has retained an aeroplane hangar and catapult forward. She had on board No. 444 (Fleet Reconnaissance Flight, consisting of Fairey III.D seaplanes, and commanded by Sq. Ldr. E. J. P. Burling, D.S.C., D.F.C.

The Times of Feb. 10 states :—

On her voyage to the China Station, to resume duty after recommissioning, the aircraft-carrier *Hermes,* Captain Geoffrey Hopwood, C.B.E., will pay a visit to Bangkok, Siam, from Mar. 9 to 13. The *Hermes* is due to-day at Aden, and, leaving there to-morrow, will be at Colombo from Feb. 19 to 22, and at Singapore from Mar. 3 to 6. She is due at Hong-Kong on Mar. 19.

The Times of Feb. 14 states :—

H.M.S. Courageous is due to be commissioned at Devonport this morning with a full crew from the Portsmouth Naval Depot for service in the Mediterranean Fleet as a second aircraft-carrier. Capt. Aubrey Lambert, who will command the ship, was appointed to her in March last, and formerly served as King's Harbour Master at Malta. The Fleet Air Arm Flights in the *Courageous* will be under the command of Wing Cdr. Robert Leckie, D.S.O., D.S.C., D.F.C.

Night Flying.

Air Ministry orders state that Night flying in co-operation with the 1st Air Defence Brigade will be carried out between sunset and sunrise every Monday, Tuesday and Thursday, from Feb. 12 to June 2, 1928, at any height over 4,000 ft. over the area bounded by Aldershot, Guildford, Woking, Chertsey, Sunninghill, Wokingham, Eversleigh and Fleet.

The University Air Squadrons.

The Oxford University authorities have now granted permission for undergraduates to fly. Regulations have been drawn up whereby the undergraduate member of the Oxford University Air Squadron must obtain the written consent of parents and college authorities and the concurrence of the medical officer before going up in an aeroplane and no undergraduate may fly unless accompanied by an instructor. In no circumstances may an undergraduate fly a machine over Oxford. Three Avro training machines (Lynx engines) have been provided for the use of the Squadron and training is done at the R.A.F. Station, Upper Heyford. The appointment of Wing Commander A. G. R. Garrod, M.C., D.F.C., to the Oxford University Air Squadron as Chief Instructor is dated Jan. 10. A biographical note about Wing Commander Garrod appeared in THE AEROPLANE on Nov. 1927

The appointment of Wing Cdr. V. S. Brown to be C Instructor to the Cambridge University Air Squadror dated Feb. 1.

Wing Cdr. Brown was born at Lewisham in 1889 and cated at Blackheath School, Eastbourne College and J College, Cambridge. He learned to fly on a Maurice Far biplane at Brooklands and his Royal Aero Club certifi No. 1395 is dated July 3, 1915. He entered the R.F.C July, 1915, and was appointed Flight Commander in Sept ber, 1916. He went to France with the R.F.C. in 1916 was awarded the Croix de Guerre. During part of the he was a test pilot at Martlesham and during that tim had a remarkable escape. He was trying to brea machine in the air and fainted during the experiment only recovered consciousness within a few feet of the gro He immediately repeated the experiment.

After the Armistice he was posted to the Instrument sign Establishment at Biggin Hill and in May, 1922 was appointed to command No. 84 (Bombing) Squad 'Iraq. In 1925 he was posted to the Depot at Aboukir in 1926 he was promoted to the rank of Wing Comma and appointed to the Central Flying School. Later in he was appointed to command the R.A.F. Station at Upa

During the time he was at Martlesham he was associ with Professor H. Melville Jones and the late Profe Bertram Hopkinson, who both were on the staff of University before the war, and the former of whom is Francis Mond Professor of Aeronautics at Cambridge.

R.A.F. SPORTS AND PASTIMES.

Rugby Football.

The Royal Navy versus the Royal Air Force.—The R Navy beat the Royal Air Force at Twickenham on Feb. 1 a goal to nothing. Group Capt. H.R.H. the Duke of K.G., was present.

After watching another of the series of defeats suff by the R.A.F. representative side this season one is incl to wonder whether the Selection Committee solve problems by drawing fifteen names out of a hat. This tainly seems to apply to their method of selecting a division for the various matches. The R.A.F. have played five matches with five different threequarter l Even allowing for injuries this seems rather overdoing chopping and changing principle. How on earth the S tors hope to get even elementary combination among backs by such a method is beyond the comprehension o mere onlooker. Anyway the weakness of whatever sy they may use was very clearly demonstrated in the m against the Navy when the gallant and sustained e of the forwards were thrown away by a back division w total lack of combination would have disgraced the r

THE 1928 VINTAGE.—The R.A.F. team which was defeated by the R.N. at Twickenham on Feb. 11 by a goal to nothing. Left to right, standing: Plt. Off. J. R. H. Pott, Flg. Off. C. H. G. Bremridge, AC. W. Munkley, Cpl. M. G. Christie, L-AC. S. G. Collins, F-S. G. F. Cockell, Plt. Off. H. A. Constantine, AA. P. B. Coote. Seated: Flg. Off. F. S. Hodder, Flt. Lt. C. J. S. O'Malley, Sq. Ldr. J. C. Russell, Flg. Off. R. V. M. Odbert (Capt.), Flg. Off. P. G. Chichester, Flt. Lt. C. D. Adams, Flg. Off. T. A. Hale-Munro.

AND NOW IN SPAIN!

In Great Britain, in Germany, in Denmark, in Turkey even in the Far East ROHRBACH LIGHT METAL AEROPLANES are the recognised craft for speed, for safety, for *service.*

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The aircraft ?

ROHRBACH three-engined ROLANDS, of course.

sentative team of a Care and Maintenance Unit. Individually and as a defence force there was not much wrong with the backs and their tackling was beyond all praise but as an attacking force they simply did not exist. Their passing was mis-timed or merely wild and although the forwards gave them the ball four times out of five both from the scrum and the line-out they invariably made a mess of everything that came their way simply through lack of practice as a team.

THE GAME.

The Navy started pressing early in the game and the vigorous thrusting of their threequarters soon had the R.A.F. on the defensive and although the Navy seemed to make ground with every movement they were driven back by the highly effective tackling and kicking of the Air Force backs. Lieut. Wood got away very early in the game on the left wing and had gained some yards before he was smothered by Coote. The R.A.F. forwards began to show their superiority and were shoving hard and heeling out smartly. Sq. Ldr. Russell got the ball away in long swinging passes, most of which Flg. Off. Odbert managed to take but from that stage onward the Air Force attacks broke down. Mr. Odbert had a bad day. He seemed fated to do the wrong thing and time and again was tackled in possession or passed too late to get the threequarters away. The wings hardly saw the ball and several times the alert Navy backs cut in and intercepted a delayed pass. An epidemic of feet-up-in-the-scrum penalties broke out at this stage of the game and as most of them were against the Air Force and therefore against the wind neither side got any "forrader."

The R.A.F. forwards headed by Flg. Off. Chichester and Cpl. Christie made a good break and gained some ground and Flg. Off. Hodder gained more ground with a beautiful long kick which found touch near the Navy Line. Shortly after this Christie was injured and although he came back he was very lame for the rest of the game. Odbert tried to cut through from a scrum near the Navy's line but failed and the Navy got back into mid-field with the ball at their feet. Russell put a good screw kick into the Press-box from a penalty. A kick against the R.A.F. for offside was neatly fielded by an Air Force forward who found touch. Shortly after this AC. Coote tried to kick a penalty goal from the half-way line. It was a magnificent effort but fell just short of the goal. At this stage of the game the Air Force were putting up a fine show and for some minutes the game was inside the Navy's twenty-five. One could not help agreeing with the voice in the stand which was lamenting, with loud oaths, the absence of Johnny Chick. The R.A.F. forwards were distinctly on top at this stage and only wanted a shade of extra speed to bring off a try. With a clear field in front of them one of the backs knocked on and the moment was lost.

The Navy seemed well equipped with "Wizards of the Interceptor Fighter class" which ought not by rights to belong to the Navy, but if the Air Force have any they are no doubt still on the secret list and probably playing for Martlesham Heath. Hodder gathered smartly after some fumbling by the rest of the threequarter line and travelled throttle open for some distance before he was brought down. A concerted attack by the Navy was defeated by valiant tackling and good kicking by Russell and Hale-Munro. Several Air Force efforts broke down by crowding on the wing. Coote got the ball once and dribbled down the wing but was tackled and kicked too far ahead and the ball went over the dead-ball line.

The game showed a little more dash all round in the second half. Odbert saved an almost certain Navy try by making a mark in front of the Air Force goal. Later the Navy found touch near the flag and Hodder, Odbert and Hale-Munro all stood out in the combined Air Force defence. Somebody had a drop at goal for the Navy but ball hit the post above the cross-bar and dropped back. A se of scrums on the wing gave the R.A.F. a few yards each time w short rushes by the forwards but each time they were driven i touch. Chichester, who was playing an excellent game, got well a from a line-out but was unsupported. Wood got away on the wing for the Navy and was past Hale-Munro when he was tack by Coote. The Navy forwards began to get very lively and H Munro had to go down on the ball at their feet in several rushe

About half an hour after half-time Wood gathered the ball fror series of blunders by the R.A.F. backs and dashed for the line. H Munro slipped and fell in going for him and he scored an e try between the posts. Lieut. Trentham converted.

The Air Force made desperate efforts to recover their lost gro in the last few minutes and the pitched battle which resulted was best patch of a rather poor game.—C. M. MCA.

The teams were :—

Royal Navy.—Midshipman C. G. Gosling (R.N.E. College, Keyha back; Lieut. W. H. Wood (H.M.S. *Harebell*), Lieut. A. R. Free (H.M.S. *Victory*), Lieut. C. R. Garrett (H.M.S. *Frobisher*), and Li J. Plunkett-Cole (H.M.S. *Dryad*), threequarter backs; Sub-Lieut. J. Forbes (H.M.S. *Excellent*), and Lieut. G. R. Cole (R.N.E. Coll Keyham), half-backs; Lieut.-Comdr. P. B. William-Powlett (H. *Rodney*) (captain), Sub-Lieut. J. W. Linton (H.M.S. *Dolphin*), Li D. P. Trentham (H.M.S. *Dolphin*), Lieut. A. A. Havers (H. *Victory*), Sub-Lieut. H. C. Browne (H.M.S. *Dolphin*), Surg.-Lieut. L Osborne (H.M.S. *Vivid*), Lieut. J. W. Cuthbert (H.M.S. *Excellent*), Lieut. W. C. Thomas (H.M.S. *Constance*), forwards.

Royal Air Force.—Flg. Off. T. A. Hale-Munro (Duxford), back; P. B. Coote (Halton), Plt. Off. J. R. H. Pott (Duxford), Flg. Off. F Hodder (Andover), and Flg. Off. C. H. G. Bembridge (Seala three-quarter backs; Flg. Off. R. V. M. Odbert (Worthydown), Sq. Ldr. J. C. Russell (Air Ministry), half-backs; Plt. Lt. C. J O'Malley (Halton), F-S. G. F. Cockell (Henlow), AC. W. Mu (Henlow), Plt. Off. H. A. Constantine (North Weald), Flt. Lt. C Adams (Halton), Cpl. M. G. Christie (Shrewsbury), Flg. Off. P. Chichester (Manston), and L-AC. S. G. Collins (Gosport), forward

The R.A.F. Swimming Association.

The following are the results of the swimming certifi competition for the season 1927. The first figure after name of the unit is the number of certificates issued cluding re-qualifications. The second figure is the stren during the period, May to September, 1927, and the t figure is the percentage obtained.

H.Q. R.A.F. Mediterranean, Malta	208	283
H.Q. Inland Area, Bentley Priory	54	87.2
No. 8 (B) Squadron, Aden	95	168.6
No. 84 (B) Squadron, Shaibah	91	161.6
H.M.S. *Eagle*	66	131
School of N.C., Lee-on-Solent	103	232
R.A.F. Station, Eastchurch	150	518
R.A.F. Base, Calshot	110	459.6
No. 5 F.T.S., Sealand	99	470.6
Far East Flight, Felixstowe	7	41
A. and A.E.E., Martlesham Heath	67	407
H.Q. Coastal Area, London	13	95
M.T.R.D., Shrewsbury	58	441.8
H.A.D., Henlow	176	1,503.6
R.A.F. Depot, Uxbridge	123	1,180.8
R.A.F. Station, Old Sarum	21	328
R.A.F. Base, Gosport	26	480
R.A.F. Station, Ruislip	17	349.4

CRASHING THE NAVY.—A Navy player effectively tackled during the first half of the game. The R.A.F. player doing a banked turn on the left is Plt. Off. Constantine, the man in the centre of the picture is Flt. Lt. O'Malley, the horizontal one is AA. Coote, and Sq. Ldr. Russell is on the right.

GLOSTER

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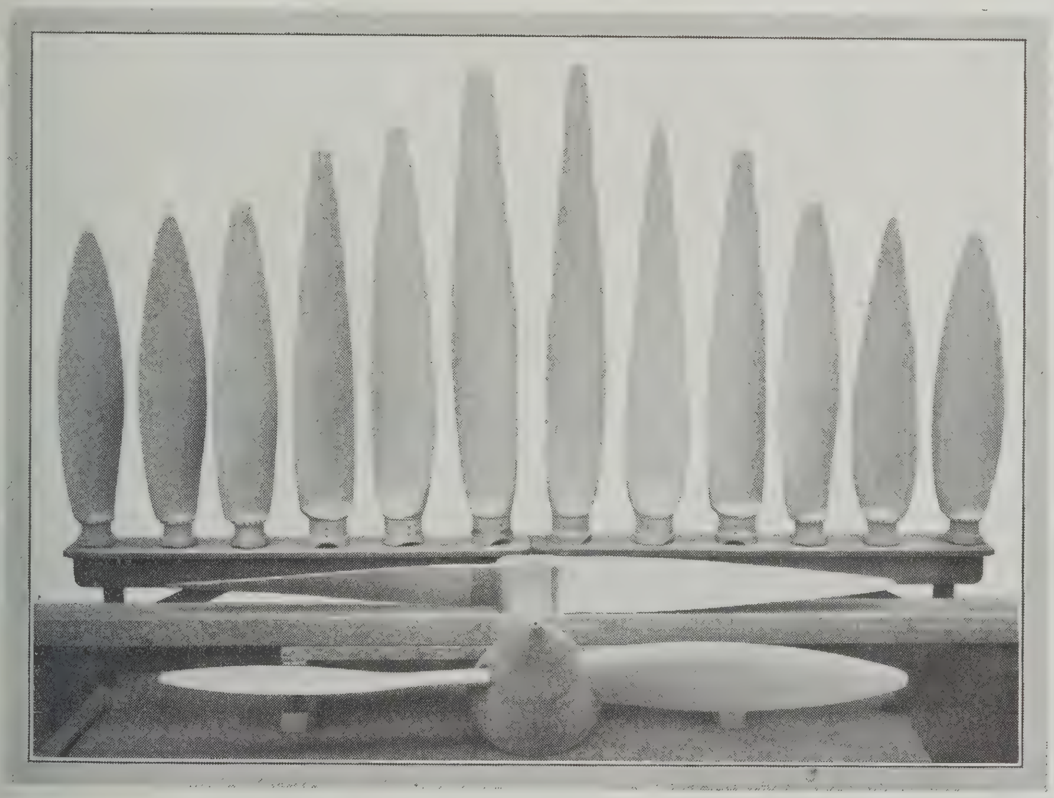


Gloster Duralumin Propellers.

The above illustration shows a group of Gloster detachable blades for propellers, which have been used successfully on the Gloster racing and Service machines. These blades are machined from the solid to the true shape by a special Gloster process, and are not twisted.

THE SERVICE FAR EAST CRUISE.

The log of the R.A.F. Far East Cruise, under the command of Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.S.C., has been issued by the Air Ministry with a copy of the Commanding Officer's Report on the arrival of the Flight at Karachi.

The report states :—

The aircraft and engines of the Flight have been very satisfactory. At every stopping place the Flight has received the greatest assistance and hospitality: all the arrangements made by the local authorities for the safety and refuelling of the Flight have worked perfectly.

The health of the Flight has been good.

The weather conditions on the whole have been good, the winds have generally been favourable and the temperature inside the hulls has seldom exceeded 80° F.

During the passage of the Flight through the Persian Gulf the S.N.O. of that station, having been asked by R.A.F., 'Iraq, to report where his ships would be, thought it necessary to send H.M.S. *Enterprise* to Bushire and Henjam to meet and assist the Flight. After he had seen the flying-boats land, secure to their buoys and refuel without any difficulty at Henjam, and after he had been shown over the flying-boats, he agreed that it was unnecessary to make any special dispositions for the remainder of the flight to Karachi.

During the stay at Karachi it was found that the water in Karachi Harbour fouls the bottoms of the ships and flying-boats, very quickly; and although an inspection of the hull bottoms on the last flight to Karachi showed the bottoms to be clean it was found that after a fortnight in the harbour the bottoms were covered with barnacles and tufts of wood. Each boat has been pulled up on its chassis on the sandy beach on the Manora side of the harbour for one day and the bottoms have been thoroughly cleaned and painted. On launching, each boat has been given a short test flight and the opportunity has been taken to give flights to G.O.C., Sind Brigade, and other officers

The following extracts are taken from the log :—

Oct. 14, *Felixstowe to Plymouth* (276 *miles*—4 *hrs.* 5 *mins.*).

The Flight left Felixstowe in formation at 09.00 hrs. and landed at Cattewater at 13.05 hrs. after a rather unpleasant flight in rain and thick mist. The boats were moored to the outer buoys off the Air Station and refuelled to 400 gallons with the assistance of Care and Maintenance Party; the fuel, in five-gallon drums, being towed out to the flying-boats in dinghies.

Oct. 15 (*Plymouth*).

Aircraft inspected by Naval C.-in-C., Plymouth, and by A.O.C. No. 10 Group, R.A.F., the latter arriving by air from Calshot.

Oct. 17, *Plymouth to Hourtin* (*Bordeaux*) (380 *miles*—5 *hrs.* 5 *mins.*).

The Flight took off in formation at 09.00 hrs. and was escorted out of the Sound by A.O.C. No. 10 Group in Southampton N.9900. The Flight landed in formation at Hourtin at 14.05 hrs. and secured to buoys near the French Seaplane Station at the North end of the lake. The refuelling was carried out from four-gallon tins towed out to the flying-boats in dinghies. The Flight was hospitably received by the French who transported the fuel to the flying-boats and entertained the officers of the Flight in their Mess.

Oct. 18 (*Hourtin*).

The Air Attaché, Paris, flew down to meet the Flight and rem until the following day, when he flew on to Berre to render assistance that might be required there. The O.C. the French Station and several of his officers visited the flying-boats.

Oct. 19, *Hourtin to Berre* (*Marseilles*) (310 *miles*—4 *hrs.* 25 *mins*

The Flight took off in formation at 08.20 hrs. and arrived at at 12.45 hrs. It was hospitably received at the French Air St

Several French officers including the Commanding Officer of French Seaplane Station and Commandant of the French Mi Aviation Base at Istres were shown over the aircraft durin afternoon.

Oct. 20 (*Berre*).

Several flying officers from Istres and three Technical officers Paris arrived at Berre to see the Southamptons.

Oct. 21, *Berre—Naples* (440 *miles*—7 *hrs.*).

The Flight took off in formation at 08.00 hrs. for Naples. French twin-engined flying-boats escorted the Flight as far as T

Half an hour before reaching Cap Corse, the most northerly of Corsica, S.1150 reported a bad oil leak from the starboard e She carried on however until able to land in a small bay on the side of Cap Corse. After twenty minutes on the water she to again and rejoined the formation, which had remained in th The leak arose from a cracked nipple where the oil pressure pipe is joined to the engine; this was blanked off temporarily.

Naples was reached at 15.00 hrs. The Flight landed in formati Nisida Island and moored to special mooring close to the I Seaplane Station. The Flight was welcomed by the British C General, the Air Attaché and the O.C. the Italian Seaplane Stati

Oct. 22 (*Naples*).

The Officer Commanding the Flight, with the Air Attaché, on the General of the District, the Admirals of the Area and and various local officials. The day was spent on general ov work and cleaning down.

Oct. 23 (*at Naples*).

The aircraft being under the lee of Nisida Island were quit at their moorings, although owing to the wind eddies from the island they swayed about somewhat and a good deal of snatch mooring wire took place.

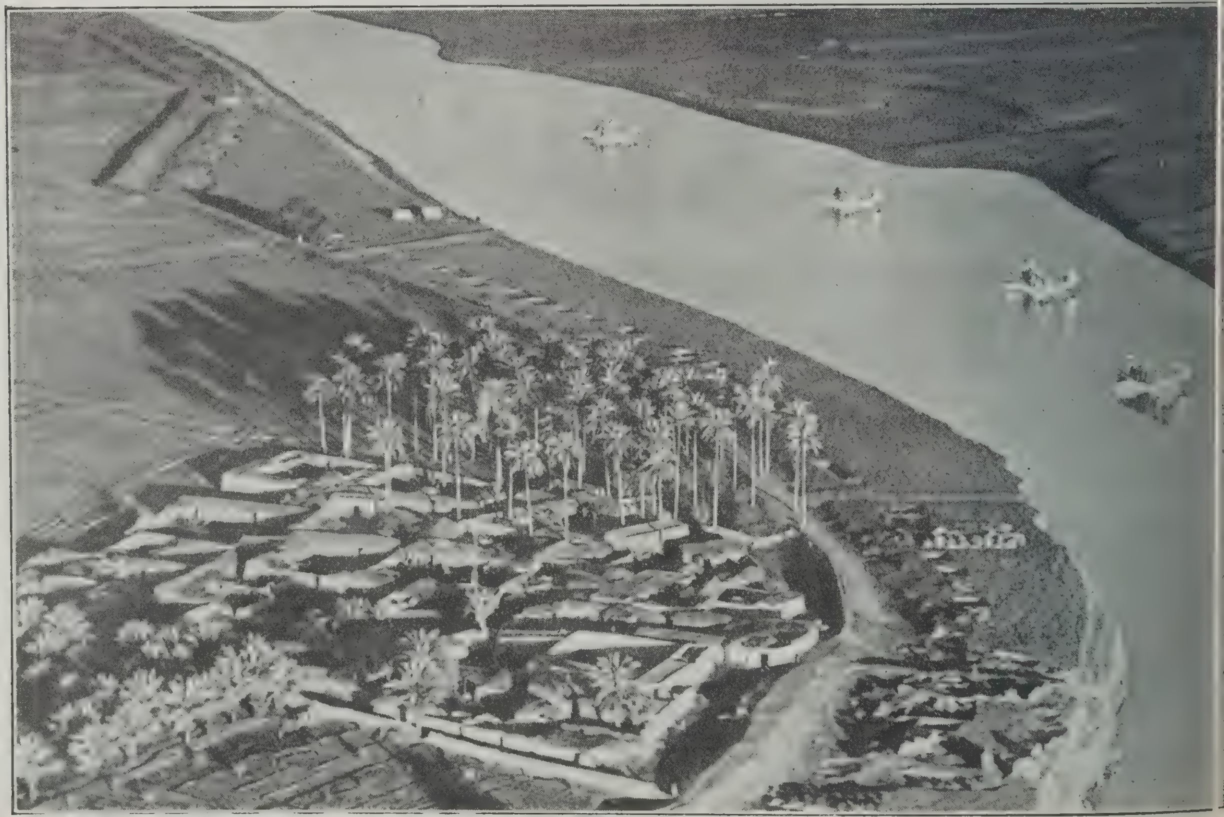
Oct. 24 (*Naples*).

The afternoon was spent showing various Italian officers ov aircraft. Throughout the stay at Naples the Flight was given assistance by the Italian Air Station.

Oct. 25, *Naples—Brindisi* (230 *miles*—3 *hrs.* 40 *mins.*).

At 07.50 hrs. the Flight took off independently in Nisida Ha On account of the swell outside the harbour and in order to the cliffs and high telegraph wires, it was necessary to ta down wind. The wind at the time was East 5 m.p.h. Lucki clouds were high so that the Flight were able to cross ov mountains on the "Heel and Toe" of Italy at 5,000 feet and p direct to Brindisi, thus avoiding the necessity of following the right round, an additional distance of about 220 miles.

The mooring site close to the Air Station and opposite the Seaplane Station was quite satisfactory, although rather close



ON THE EUPHRATES.—The R.A.F. Far East Flight moored on the Euphrates near Ramadi, 'Iraq. Th Flight reached Mergui, Burma, on Feb. 13.

METAL CONSTRUCTED

SUPERMARINE

"SOUTHAMPTONS"

FAR EAST FLIGHT

PATROL OF THE OCEAN.

Flying Boats May be Used to Assist Navy.

"The arrival of the four Supermarine Napier flying boats at Calcutta after flying in formation 9,000 miles from Plymouth, opens a new era in the development of big flying cruisers," said an official at the Croydon air station to a Press representative yesterday. "This is the first time a voyage of such a distance has been made by a flight of flying boats, and its success heralds the development of large flights of such air cruisers to help in the patrolling of Britain's ocean highways.

"The success of the flight of the Supermarine - Napier flying boats points the way to the Fleet air arm assisting the Navy in its ocean patrols, with a consequent reduction of expenditure."

THE PATROLLING OF BRITAIN'S OCEAN HIGHWAYS.

CALCUTTA, January 27.

The four R.A.F. Supermarine-Napier flying boats left Lake Chilka at eight o'clock this morning, and alighted on the Hooghli at Ichapore, 18 miles from Calcutta, at 12.20.

The machines have now covered 9,000 miles of their 23,000 miles' programme, and the whole distance has been flown without mishap of any description.—Reuter.

AERIAL OCEAN PATROLS

Flight to Calcutta Shows How Flying Boats May Assist Navy

"The arrival of the four Supermarine-Napier flying boats at Calcutta (announced in a Reuter telegram yesterday) after flying in formation 9,000 miles from Plymouth, opens a new era in the development of big flying cruisers," said an official at the Croydon Air Station yesterday.

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R.A.F. FEAT.

SEAPLANES' 9,000-MILES FLIGHT WITHOUT MISHAP.

CALCUTTA, Friday.

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NAVY OF THE AIR.

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9,000 MILES FLIGHT WITHOUT MISHAP.

Fine Achievement by Four R.A.F. Planes.

FLYING TO TIME-TABLE.

CALCUTTA, Friday.

The four R.A.F. Supermarine Napier flying boats which left England on a 23,000 miles tour alighted on the Hoghli River at Ichapore, 18 miles from Calcutta, at 12.20 to-day.

The machines have now covered 9,000 miles of their journey, and the whole distance has been flown without mishap of any description.

It is the first time that an attempt has been made to fly round India, and the fact that four machines, flying in formation, have accomplished this in accordance with a prearranged time-table and without mishap opens up possibilities of other Empire air routes.—Reuter.

R.A.F. FLYING BOATS AT CALCUTTA

9000 MILES WITHOUT MISHAP

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"SOUTHAMPTONS" DESIGNED AND CONSTRUCTED BY

THE SUPERMARINE AVIATION WORKS, LTD.

The above newspaper cuttings appeared on Jan. 28 in the Daily Chronicle, Manchester Guardian, Westminster Gazette, Daily Mirror, Yorkshire Post, Birmingham Post and Glasgow Herald.

shipping channel. The buoys were not specially laid, the Flight using ordinary ship moorings.

Oct. 26 (Brindisi).

The Officer Commanding the Flight, with the Air Attaché, Rome, called on the British Vice-Consul, the Prefect and the S.N.O.

During the day a cable was received from Athens stating that the fuel had not yet arrived at Suda Bay although despatched a week before by motor caique. The cable added that possibly moorings and fuel could be arranged at the Greek Air Station at Phaleron Bay, Athens.

Oct. 27 (Brindisi).

Aircraft were fuelled up to 500 gallons of petrol in case enough petrol was not available at Athens.

A further cable was received from Athens stating that nothing had been heard of the petrol caique. It was therefore decided to fly to Athens at dawn on Friday and carry on to Suda Bay if the petrol had arrived there.

Oct. 28, Brindisi—Athens (340 *miles*—4 *hrs.* 55 *mins.*).

The Flight took off in formation just before daylight and had a good flight to Phaleron Bay.

The Flight was met by officers from the Greek Air Station, and by officers of the British Mission under Wing Commander Edmonds. As there was still no news of the petrol caique all the aircraft were refuelled to 500 gallons without difficulty from 40-gallon barrels in preparation for the direct flight to Aboukir on the following day.

Oct. 29, Athens—Aboukir (500 *miles*—6 *hrs.* 35 *mins.*).

The Flight left Phaleron Bay in formation at 06.25 hrs. A few rain storms were flown through between Athens and Crete.

The Flight landed in formation at 12.55 hrs. and were met by Air Cmdre. Board, representing the A.O.C., Middle East, and Group Capt. Brooke, Commanding the R.A.F. Depot.

Oct. 30 and 31 were spent on routine inspection, overhauls and cleaning down.

Nov. 1 (Aboukir).

S.1151 was fitted with one Aboukir-made airscrew for air tests and made a satisfactory flight of 10 mins.

Nov. 2 (Aboukir).

Routine inspections completed.

Nov. 3, Aboukir—Alexandretta (440 *miles*—6 *hrs.* 30 *mins.*).

The Flight left Aboukir in formation at 06.00 hrs. and after flying through or round frequent heavy thunderstorms, landed at Alexandretta at 12.30 hrs. and secured to buoys laid off the town. W/T. could not be used during the early part of this flight owing to the thunderstorms.

Nov. 4 (Alexandretta).

S.1150 found it necessary to change both airscrews as the brass on each blade had begun to bulge and draw the fastenings.

Nov. 5, Alexandretta—Ramadi (8 *hrs.* 30 *mins.*).

Rain fell in the early morning but cleared away before daybreak, allowing the Flight to leave in formation at 06.00 hrs. Some difficulty was experienced in getting through the pass in the mountains behind Alexandretta, owing to the down currents and low clouds. One French aeroplane (Breguet) accompanied the Flight through the mountains and was joined by several others near Aleppo.

At 08.15 hrs. the river Euphrates was reached at Meskene and course set along it.

From 08.30 hrs. until 11.30 hrs. the Flight was passing through heavy rain which later gave way to dust. The clouds during this period were about 400 feet and the visibility a few hundred yards. As a more or less direct course was steered the Flight was sometimes over the river, but more often over the desert and in many Arab camps the low flying formation caused considerable movement amongst the cattle and people.

It became obvious that unless the weather improved, the Flight had insufficient fuel left to reach Baghdad. At 12.30 hrs. the ground speed again dropped to 50 knots and it was decided to land at Ramadi—60 miles from Hinaidi—and refuel from the emergency landing ground there.

The Flight therefore landed one by one in the river at 14.30 hrs. and rode to their anchors for the night. Thirty gallons of petrol were taken in by each boat during the evening by means of one of the collapsible dinghies, no local boats being available.

During the later stages of the flight the atmospherics stopped W/T. communication between the Flight and Baghdad. On landing at Ramadi it was found that land line communication had been stopped by the storm and it was late in the evening before a signal could be got through that the Flight was safe at Ramadi and needed no assistance.

Nov. 6, Ramadi—Hinaidi (60 *miles*—1 *hr.* 10 *mins.*).

At 08.00 hrs. heavy rain set in but cleared enough to allow the Flight to leave at 09.35 hrs. All the aircraft grounded lightly on sandbanks while worming through. The sandbanks could not be seen either from the air before landing, or from the surface and they were difficult to locate by sounding whilst taxying. All the aircraft got off without danger. After 1 hr. 10 mins.' flying the Flight landed at Hinaidi in succession and secured to special moorings laid by the R.A.F. Depot. The river channels were clearly buoyed and the arrangements made by the R.A.F. were excellent. The personnel were welcomed by the A.O.C., 'Iraq, who immediately inspected the Southamptons.

Nov. 7 (Hinaidi).

S.1149 found both wood airscrews had similar defects to those found in S.1150 at Alexandretta As the spares for the Flight had not arrived at Hinaidi temporary repairs were carried out which lasted to Basra, where two new wooden airscrews were fitted.

Nov. 8 and 9 (Hinaidi).

All the personnel of the Flight were inoculated against cholera at Hinaidi Hospital as there was an epidemic in 'Iraq at the time.

Nov. 10, Hinaidi—Basrah (260 *miles*—4 *hrs.*).

At 09.00 hrs. the Flight took off in succession and after circling Hinaidi in formation proceeded down the Tigris to Diala and thence to the Euphrates and down that river to Basrah, which was reached at 13.00 hrs.

The four buoys for the flying-boats were situated on the left side of the river opposite the R.A.F. Depot. The river at this point is about 300 yards wide and has a current of about 3 knots. The g objection to this mooring site is the native boat traffic which pa constantly day and night, and, if there is no wind, completely of control. To guard against this serious risk an officer of Flight was detailed to patrol in a motor-boat during the hours darkness, and a guard boat was anchored at each end of the line moorings with an officer and four airmen on board with an A lamp which lit up any passing craft. The searchlight from the boat *Grayfly* was also turned on to the flying-boats at intervals du the night. These precautions kept the Flight free from dan during their stay.

Nov. 11 (Armistice Day at Basrah).

The two minutes' silence was observed on board the flying-boats 11.00 hrs. local time.

A cable was received during the day giving the disposition H.M. Ships in the Persian Gulf, also a cable from Bushire stating quarantine (cholera) was unavoidable at Persian ports and the perso could not be allowed to land in Persia.

Nov. 12, Basrah—Bushire (190 *miles*—2 *hrs.* 45 *mins.*).

The Flight took off in succession at 07.55 hrs. escorted by D.H.9as from the squadron at Shaibah.

During the flight W/T. Communication was established with sev merchant ships in the Gulf on 600 metres.

Nov. 13 (Bushire).

Personnel not allowed to land owing to quarantine and the day spent cleaning up the flying-boats. The river being free from sha bathing was permitted from the flying-boats, an opportunity of w everyone took advantage, as the problem of baths, especially for airmen, is a difficult one.

Enterprise left during the afternoon to meet the Flight at Hen in accordance with orders issued by S.N.O., Persian Gulf.

Nov. 14, Bushire to Henjam (348 *miles*—4 *hrs.* 40 *mins.*).

The Flight took off in succession at 07.30 and by request pa low over the town in formation.

Henjam is a small, barren, rocky island which is used as a by H.M. ships stationed in the Gulf.

Nov. 15 (Henjam).

Flg. Off. Scott was taken sick during the day and was treated the Medical Officer on board H.M.S. *Triad;* he was able to leave the Flight on the following day. This was the only case of sick since the Flight started; the general health of the crews b excellent. During the afternoon all the personnel landed on Hen Island for exercise.

Nov. 16, Henjam—Gwadah (380 *miles*—5 *hrs.* 40 *mins.*).

The mooring and fuel arrangements had been made from Kar and were quite satisfactory, although the use of 2-gallon tins, for first time during the cruise, made refuelling rather slow. The Fl only refuelled to 300 gallons per boat so as to assist the "take in case the swell increased.

The Flight was met by the Political Officer for Makran who travelled down from Quetta with his escort to welcome the Fl and render any assistance required. In order to relieve him f another long journey by camel and car back to his district, he offered and accepted a passage to Karachi in one of the boats the Flight.

Nov. 17 (Gwadar).

During the morning a breeze blew up from the East and a siderable swell rose immediately, enough, probably, to preve take off with full load. Later the wind died down but a slight s remained all the time the Flight were at Gwadar.

Nov. 18, Gwadar—Karachi (260 *miles*—3 *hrs.* 35 *mins.*).

The Flight took off in formation at 07.30 hrs. Owing to the s the flying-boats taxied under the lee of the promontory and off along the swell. No trouble was experienced and all took well.

A few miles off Karachi the Flight were met by an escort D.H.9as and Bristol Fighters from the R.A.F. Depot. The flying- landed in Karachi Harbour in succession at 10.55 hrs. and were by the G.O.C. Sind, the Officer Commanding R.A.F. Depot, and local officials.

The mooring for the flying-boats are laid in the river opposite shipping wharves and are quite satisfactory except that a cons stream of traffic passes close to the aircraft and there is dange collision, particularly when the wind drops and the sailing craft drifting on the tide. Arrangements have been made with the har police to have patrol boats constantly on watch and an officer and airmen are always kept on board the flying-boats to act as a g

The table of statistics for the first stage of the Cruis Karachi shows that the average ground speed was 67 kn The total average flying time per aircraft was 72 hrs. mins., and the total distance covered in nautical miles 4,834.

SIR ALAN COBHAM'S PROGRESS.

On Feb. 6 Sir Alan Cobham and party, as reported last week's issue of The Aeroplane, arrived at Kisumu f Entebbe, carrying Sir William Gowers, Governor of Uga as passenger.

On Feb. 9 he flew from Kisumu to Mwanza, on southern shore of Lake Victoria, and back to Entebbe way of Bukoba and Port Bell, thus completing a comp circuit of Lake Victoria.

On Feb. 10 he flew to Mongalla, and on the following returned to Khartum.

This flight from Mwanza back to Khartum was made the desire of the Colonial Office.

On Feb. 12 he flew from Khartum to Mongalla, a dista of 820 miles, in 8 hours non-stop. During the course of flight, he flew through smoke and ash from grass fires height of 4,000 feet.

COASTAL DEFENCE

"Flight" Photo.

"The Hawker 'Horsley' Torpedo Bomber as illustrated is now in production. The machine meets in every respect the exacting requirements of torpedo carrying aircraft and can be considerably overloaded without impairing its efficiency."

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THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS

THE REID REACTION TIME APPARATUS.

In The Aeroplane of Aug. 12 and 19, 1925, there appeared a description of the Reid Reaction Time Apparatus in which the theory of this machine was discussed at some length, and the opinion—based on the results of the limited practical tests that had then been made—was expressed that it could and did distinguish between individuals who possessed good flying " hands " and those who did not in an uncannily accurate manner.

The Reid apparatus was designed and developed by Flt. Lt., now Sq. Ldr., G. H. Reid, D.F.C., as an attempt to simplify the selection of suitable candidates for flying training in the R.A.F. His work in this matter was given every possible encouragement by the Medical Service of the Royal Air Force.

Since the date when the apparatus was first described it has been given a long practical test by the R.A.F. and in the Report on the Health of the Royal Air Force for the Year 1926, which has recently been published, some very interesting data as to the results of this test are to be found. The tests there recorded were made at No. 2 Flying Training School (Digby) during 1926.

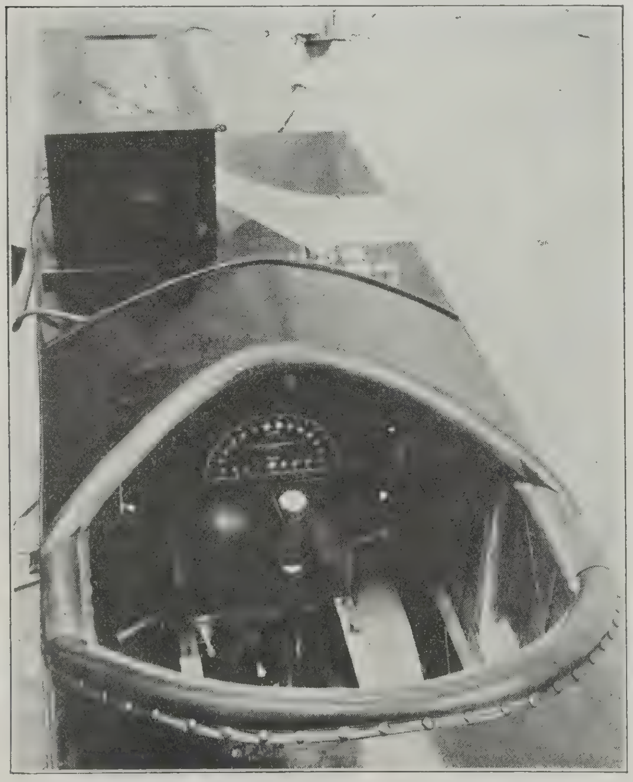
All pupils at this school were put onto the Reid gear. The charts of these pupils were given code numbers only and the code was kept secret from the instructors at the school, who thus had no knowledge at all of what the apparatus had predicted of their pupils.

All junior term pupils were tested on the Reid gear at the beginning of the term and at the end of the term, when their primary training on Avros was completed. All senior term pupils were tested at the beginning of their training on Service type machines and again at the end of that training.

The pupils were then graded into classes according to their probable aptitude for flying as indicated by the apparatus and the results of this grading were compared with the reports of the flying instructors on the same pupil. The machine's assessment of flying aptitude tallied very closely indeed with the reports of the instructors.

The junior term pupils were graded into three classes, (1) those likely to make unusually good pilots, (2) those of average aptitude, and (3) those of less than average aptitude and unlikely to make satisfactory pilots. On the completion of Avro training there was agreement in 23 cases out of 26 between the forecast of the machine and the reports of the instructors.

In the case of the senior term pupils the tests on the machine were used to grade the pupils into five classes, (a) exceptionally good, (b) above average, (c) average, (d) below average and unsatisfactory, and (e) failures as pilots. In 19 cases out of 32 the grading from the charts taken on the Reid gear and that given by the instructors agreed. In 12 cases out of the remaining 13 the machine and the instructors differed only by one grade. The one remaining case was that of a pupil who was not completely recovered from concussion after a crash.



THE REID REACTION TIME APPARATUS.—This view shows the control stick and the quadrant bearing the coloured light indicator. Beyond the cockpit on the left is the recording apparatus.

For these senior pupils the machine definitely selected the two best pupils, who were classed as " natural pilots " by their instructors, two doubtful pupils, one of whom subsequently ceased training, and it very clearly indicated the smaller aptitude of these pupils who in fact made slow progress in flying.

In addition a further test was made to determine the valu of the machine for training pilots in regard to accuracy o handling of controls. Half the junior term pupils wer selected for training on the apparatus. Care was taken t see that this selected batch had an average aptitude—a shown by their first test on the Reid gear—approximatel equal to that of the other batch.

The results of this test show that the machine cannot trai pupils who originally possess no aptitude for flying. Thes pupils show no improvement in the charts they make on th machine, neither do they show signs of improving in thei flying. On the other hand those who have moderate aptitud to start with and possess the capacity to improve can learn by properly supervised training on the machine, a bette co-ordination of the various control movements needed fo flying.

In this last test of the 16 pupils who trained on th apparatus, 4 were able to fly solo by the end of their fift week of training as against 2 only of the 16 who had no practised on the machine. At the end of nine weeks, 10 c the pupils trained on the Reid gear had flown solo, and onl 6 of those not so trained.

A particularly interesting point in this connection is tha certain pupils were sent by their flying instructors to practice on the Reid apparatus in order to remove specific fault which had been noticed in the air. It is not possible to giv any definite proof of the success of this special practice, bu this action was taken on the initiative of the instructors an in the belief that it had good effects.

The Medical Officer at the station found that the apparatu was of great value to him in deciding whether pilots we fit to fly after they had suffered accidents causing sligl concussion. The curve written on the machine indicate any instability resulting from such a cause in a very clea manner.

From these tests it has been concluded tentatively that tl assessment of flying aptitude by this apparatus is soun It is particularly useful in coming to a decision in the ca of doubtful pupils. Every one whose average reaction tin at first test exceeded four seconds proved an unsatisfacto pupil and therefore it seems possible to set a defini standard by this instrument and thus weed out hopele candidates from the beginning.

And as an aid in flying instruction the machine has show that pupils who have the necessary aptitude can by trai ing on it be given better co-ordination of their movement and thereby have their progress in actual flying accelerate with a marked saving in the cost of flying training.

It must be understood that no claim is made that tl apparatus can teach flying. It can select persons who posse certain qualities necessary for flying and reject those wl have not these qualities. It can provide a training whi will improve those qualities in those who possess the capaci to improve, and it can therefore save both time and mon in the selection and training of pilots.

As a result of these and other experiences with the Re Reaction Time Apparatus, the R.A.F. have now decided instal these machines in all their Flying Training Schoo

Sq. Ldr. Reid, who has recently retired from the R.A. has now formed in conjunction with Mr. Sigrist, of the H. Hawker Engineering Co. Ltd., a company—Reid and Sigri Ltd., Athenæum Works, The Vale, Hampstead—which manufacturing Reaction Time apparatus for the Royal A Force, and is also engaged in the development of a numb of other interesting off-shoots of Sq. Ldr. Reid's ingenuit

The reaction time apparatus which is now being produc is in essentials the same as that which was described 1925. It consists of a section of a fuselage containing pilot's seat and a stick and rudder-bar control. Coupled the stick is a quadrant mounted on the dashboard, equipp with one central white light and a series of red and gre lights, very like the indicator of the Reid Control Indicat

TITANINE

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"Tetrafree, Piccy, London."
Codes: A.B.C. 5th Ed. and Bentleys.

Below this is a horizontal row of lights, one central white, with starboard green and port red lights on each side. In addition there is a vertical row of lights at the side of the fuselage with again a central white light with reds above and greens below.

By a series of electrical contacts, it is arranged that the central white light of each of these sets of indicators shall alone show only when the particular control which it concerns is accurately centred.

Movement of the stick to one side or other causes one or more of the coloured lights on the quadrant to show up. Movement of the rudder bar similarly controls the lights of the horizontal row, and fore and aft movement of the stick controls the vertical row of lights.

The function of the machine is to measure the time taken by the person under test accurately to centralise the controls from disturbed positions. Any one, or any combination of sets of lights may be used simultaneously.

The standard test for flying aptitude is to time the pupil (1) for centreing the stick alone, first from hard left and then from hard right; (2) for centreing the rudder alone from hard right forward and from hard left forward; and (3) for centreing both stick and rudder simultaneously, from rudder hard over one way and stick the other, also in both directions, i.e., rudder left and stick right, rudder right and stick left.

The pupil is given a certain amount of unrecorded practice to get the general idea, and he is then given ten timed tests of each of these sets of movements.

The time taken for each movement is automatically recorded on a chart, from which his aptitude for flying is deduced after considering both the average times taken in each set of movements, and the consistency or otherwise of the time for each individual movement of the same set.

In details the apparatus being built to-day is a marked advance on the earlier experimental models. The improvements made mainly concern the recording apparatus. In the original model the time taken for each control movement was recorded by the length of a trace made by a Morse telegraph printer on a tape, and it was necessary to mark off from the tape the length of each trace to make a chart.

Sq. Ldr. Reid has now produced a singularly neat and ingenious recorder which draws its own chart quite automatically. Space will not permit of a description of this, but it is well worth careful study by all interested in instrument design.

The timing gear can be used in instruments based on the same general principles as the apparatus above described for testing the aptitude of individuals for quite other pursuits than flying. It is in fact being used for testing telegraphists, telephone operators and certain other types of persons whose value depends on their manual-operating accuracy and there seems to be a very wide field for its use for such purposes.

ROLLS-ROYCE PROFITS.

At the Annual General Meeting of Rolls-Royce Ltd., held at Derby on Friday, Feb. 10, the chairman, Lord Wargrave, stated that the profits for the year 1927 amounted to £156,878. The directors proposed to pay a dividend of 8 per cent. and to add to it a bonus of 2 per cent., which would absorb £81,378. This would permit of placing £50,000 to reserve, and the carrying forward of £30,000.

Since the last report, two new types of Rolls-Royce aero-engines had been produced. Both of these had very successfully passed the severe tests to which such engines were officially subjected, and a number of them had been delivered to the Royal Air Force for installation in experimental machines.

The results obtained with them so far had been very encouraging, and orders for these engines in considerable quantities were hoped for in the future.

In the course of his report Lord Wargrave said :—

> I think it my duty to say on behalf of myself and colleagues that the very satisfactory result of the past financial year is in a great measure due to the untiring and successful efforts of Mr. Basil Johnson (our managing director) and the special committee of our officials which the board set up towards the end of 1926 to reorganise and effect economies. The result of their work has been to rectify the adverse effect of the disastrous industrial conflict of 1926. We owe Mr. Johnson, Mr. Wormald, our works manager, and this committee our very special thanks. I have again also to emphasise, as in previous years, our obligation to the whole of our staff and employees, who have done admirable work and whom we consider as second to none.

(The two new engines referred to in this report are the Rolls-Royce F.10 and F.11 engines, produced by the combined efforts of Mr. F. H. Royce and Mr. A. J. Rowledge. The F.10 is a twelve-cylinder V type engine developing 485 b.h.p. at 2,100 r.p.m., which was illustrated and described in THE AEROPLANE of June 22, 1927. The F.11 is a further development of the same type concerning which no data are as yet available.)

AVRO PROFITS.

The annual report of Crossley Motors Ltd. shows tha
operations during the year ending Oct. 31, 1927, led to
trading loss of £65,518. This loss converts the credit o
£28,487 brought forward in the previous year into a debi
balance of £37,031 to be carried forward this year.

The loss is attributed by the directors to the costs o
developing the new Crossley six-cylinder 20.9 h.p. car, and th
report mentions that if the accumulated profit and reserve
of A. V. Roe and Co. Ltd. had been distributed, instead c
being retained as working capital, the adverse balance o
the year's trading would have disappeared.

Some considerable part of the capital of A. V. Roe an
Co. Ltd. is held by Crossley Motors Ltd. The statemen
quoted therefore conveys the comforting assurance that th
accumulated profits and reserve of A. V. Roe and Co. Ltc
appreciably exceed £37,031.

PILOTS AND ENGINEERS.

A week or two ago two paragraphs appeared in THE AERC
PLANE, one saying that pilots were wanted for an air line i
Australia, and the other saying that pilots and ground er
gineers were wanted for a well-financed firm in one of th
British Dominions. Answers to those two paragraphs wer
immediate and numerous. But the most striking thing wa
that there were about four times as many applications fro
really competent and thoroughly qualified ground engineer
almost all of them in good employment, as there were fro
pilots—despite the fact that there were two firms wantin
pilots and only one wanting ground engineers.

A number of the applicants for jobs as pilots were fro
Short Service officers now in the R.A.F. whose terms
service will soon expire, and there were comparatively fe
from pilots who have left the R.A.F. and are now, presun
ably, looking for jobs,—if there be any truth in the constantl
reiterated complaint that Short Service officers are cast o
on a cold and unsympathetic World without any means
making a living.

Why should well paid engineers want to go abroad whe
apparently unemployed pilots do not? Or is it that the i
telligent engineer reads his Trade paper carefully, where
the junior pilot, after glancing through the R.A.F. sectic
of the paper, devotes his attention to the illustrated dailies

In spite of all one hears about the troubles of time-expire
Short Service officers, one is rather being forced to the co
clusion that a great many of them do not like flying,
one may judge by the difficulty there is in finding real
capable hard-working pilots when there are vacancies f
them. Besides this curious lack of applications for well-pa
jobs, one has come across many instances in the past tv
or three years, of time-expired pilots who have been give
good flying jobs in Civil Aviation and have failed to ma
good. Is there something wrong with the quality of Sho
Service officers—at any rate as selected between five a
seven years ago?

Another curious fact about these vacancies is that althou
thousands of experienced war pilots returned to Australia a
Canada after the War 1914-18, the British Dominions see
to turn to the Mother country for pilots when they wa
really good men. Even allowing that the Australian a
Canadian war pilot gave up flying nine or ten years ago, o
would have imagined that there would still be enough
the younger pilots, of ages now between 28 and 33, to ha
supplied all present needs in the Dominions,—especially
practically all our own commercial pilots flew during t
War 1914-18.

Anyhow, there seems considerable difficulty in getting go
pilots when they are needed. And one will be glad to kn
of any who want jobs.—C. G. G.

A MUNICIPAL AERODROME FOR BLACKPOOL.

According to an announcement made by the Mayor
Blackpool, the Corporation of that town are promoting a B
before Parliament giving them powers to acquire and ma
tain a municipal aerodrome. The subject has apparen
been thoroughly discussed locally, and the Corporation f
assured of the support of their ratepayers. The Air Coun
has signified its approval of the scheme, and the Corporati
has secured a site of between 500 and 600 acres for the p
pose.

This aerodrome is to be surrounded by a race track
motor-cars, and with accommodation for a large number
spectators, and will be used not only for any commerc
flying that may occur at Blackpool, but also for joyridi
and for aerial and motor race meetings.

The Air Ministry has undertaken to advise the Corporati
concerning the lay-out of the aerodrome, and the necess
buildings.

For Business or Pleasure The Ideal Light Aeroplane.

THE Westland Widgeon III.—The most practical proposition for private owners, and for club and school use, etc. Strongly built with stout steel-sprung undercarriage; wings braced with struts, no rigging to need adjustment. Excellent view for pilot and passenger due to parasol construction. Furnished with British Air Ministry Aerobatic Certificate. Can be fitted with dual control. Low petrol consumption (15-20 m.p.g.). High touring speed (80-90 m.p.h.). Wings fold for garaging in small space. Fitted with Cirrus II Engine. Price: £750, ready to fly away.

Fastest Light Aeroplane to finish in the King's Cup Race, 1927.

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The WESTLAND WIDGEON

THE REPAIR OF ENGINES IN THE R.A.F.

The paper by Wing Cdr. I. G. V. Fowler, A.F.C., R.A.F., of the Home Aircraft Depot, Henlow, on "The Repair of Aero-Engines," read before a joint meeting of the Royal Aeronautical Society and the Institution of Automobile Engineers dealt almost entirely with the problems of engine repairs from a Service point of view.

Wing Cdr. Fowler pointed out that aero-engines worked under very different conditions from engines used for mechanical transport. A very high standard of reliability was required of them, though they had to endure long periods of full-throttle running and at the same time their weight had to be cut to the absolute minimum.

The Problem of Service Repairs.

To maintain the reliability necessary aero-engines on an average had to be overhauled completely about once in 100 flying hours. This period was generally shorter in engines overhauled by Service personnel than engines overhauled by their makers, the result of a difference in standards of skill.

When a large amount of flying was done the flow of aero-engines coming in for repair would reach very large figures. In long-continued warlike operations, the problem of repairing engines would become of vital importance.

Taking a long view this difficulty must be overcome by greatly increasing the period between overhauls—or better still by producing an engine which had a life of 1,000 hours without needing any more than top overhauls, carried out by Squadron personnel. If this could be accomplished it might even pay to scrap the engine at the end of 1,000 hours and not overhaul it at all. This was an ideal, but one he believed possible of attainment.

Pending the attainment of this ideal the practical alternative seemed to be the design of engines so that repair could easily and quickly be made by Squadron personnel. This would mean the design of components such that their replacement needed the minimum of fitting—preferably none.

For instance white-metal bearings which gave a good deal of trouble should be replaced by roller or ball bearings. Supplies of such bearings gave a good deal of trouble in the last war, so that broad-based sources of supply must be arranged.

Output versus Training.

At present the R.A.F. was attempting to do as much of its engine repairs as possible in Squadrons rather than in depots, but it lay with the designers of engines to make extension of this policy possible.

Distribution of engine repairs and of the necessary tools among a large number of squadrons could not produce so large an output of repaired engines as could be obtained by concentrating repair work in a depot. But if repair work were so concentrated Squadron personnel would never have experience of repair work, and depot personnel would get no running experience. This would lead to the existence of two different types of fitter personnel in the Service neither interchangeable with the other.

At present the policy adopted was to repair the majority of engines either at Service depots or through contractors. A small proportion only were repaired in squadrons for the instruction and experience of Squadron personnel.

The Service depot's main object was the production of skilled mechanics and especially of N.C.O. mechanics for the general purposes of the Service, and there output of repaired engines had to be made a secondary consideration.

Thus these depots, and particularly the Home Depot, could deal only with a small proportion of all the engine overhauls needed by the Service.

The Functions of Repair Depots.

The functions of the repair depots in India and 'Iraq differed from those of the Home Depot or the Depot in Egypt. The cost of British labour in India and 'Iraq was so high that it was economical to post to the depots in those countries only the most skilled men and not to attempt to use them for the training of Service ex-apprentices.

In the Home and Egyptian Depots such training was regarded as a principal object. At Henlow training took precedence over output, and this fact dominated the whole organisation and scheme of operations there.

Practically every man in the Home Depot was in the position of an improver. A small proportion of the N.C.O.s had experience corresponding to that of a craftsman in civil life and these men corresponded to foremen in civil factories.

The improver in the Service had to work alongside men little more skilled than himself. A system of inspection far more detailed than was needed in civil factories was required to check the numerous errors which must occur.

A much greater output of repaired engines and possibly more reliable and longer-lived engines could be obtained if Service depots could be modelled on civilian workshops—that is on a one-man one-job base with a bonus for output.
But the primary importance of producing skilled men forba
such a reorganisation.

Periods of Service at Henlow.

At present the Henlow depot was permitted to retain
apprentices for one year at least. It would be better if
period could be extended to two years to consolidate
training received during their three years at the School
Technical Training, Halton. At present this was not
sible, but it was being considered whether the more pro
ing ex-apprentices should be given two years at Henlow

Civilian mechanics were usually specialists on one eng
—often on only one component—but the Service mecha
might have at any time to work on several types of engin
He therefore required rather a general knowledge of
types than a special knowledge of one.

Mechanics coming to the engine shop at Henlow we
set to work on one particular component for a period, th
on another until they had passed through the whole ov
haul of one engine. They were then turned on to anot
type.

As far as possible the latest repair methods were us
Every effort was made to adapt the jigs and tools used
the engine-maker's works. The depot staff continually
signed, made, and modified jigs and hand-operated to
for repair purposes, which could be used not only in
depot but also by squadrons. These tools and jigs wo
be of great value to a squadron in making overhauls in
field of operations out of reach of workshops.

Ultimately, when engines had become sufficiently relia
Wing Cdr. Fowler hoped depots such as Henlow would
used only for the repair of new types of engines and to g
experience in the production of tools which would ena
squadrons to do all their own repairs.

Shortage of Skilled Supervisors.

Supervision of work at Henlow was as far as possible
experienced N.C.O.s, but the Service at present was pass
through a phase in which practically all the experienced w
time N.C.O.s had left and enough experienced post-
N.C.O.s had not been produced. As soon as this stage
passed supervision would improve, and the value of Henl
training would increase. The Air Ministry permitted N.C.
and others graded as instructors to remain at Henlow fo
minimum of three years, and it would be an advantage
this could be increased to four or five years.

Though the depot's output was low for reasons alre
discussed every effort was made to secure that the qua
of their overhauls should be high. To this end a close liai
with the engine manufacturers was maintained. Engi
overhauled at Henlow were occasionally sent to the mak
works for test and inspection by A.I.D. Officers and m
often went to makers' works on visits or for courses, and c
tractors' personnel were sometimes attached to the depot
periods of a month. Thus the best methods of civilian
tories were imported into the Service.

Similarly a close liaison with the squadrons was m
tained. Engines and aircraft after overhaul were allot
direct to the consuming unit by the depot, and squadr
were asked to make early reports so that if any complai
were made action could be taken with the personnel
sponsible. Authority had been sought for exchange of
sonnel between the depot and squadrons, direct correspo
ence and visits had been approved and the depot was
sponsible for the direct supply to squadrons of special to
modification charts, drawings, etc.

Following this outline of the organisation and objects
the Henlow depot Wing Cdr. Fowler described the act
process of overhauling a Liberty engine.

The Life of Service Engines.

At the end of this description a chart giving some
interesting data concerning the lives of six different types
engines overhauled at Henlow was shown. These engi
unnamed, were three water- and three air- cooled engine

Water-cooled engine "A" had been in service some ti
had been free from major modifications for some years.
was well known to pilots and mechanics. It had pro
thoroughly reliable as present-day engines go. The lon
time run before overhaul for any engine of this type d
with at Henlow was 267 hours 55 mins. The average t
for the same set of engines to first overhaul was 108 hou
mins., and the average time between one overhaul and
next 154 hours 56 mins. An average of 877 man hours
overhaul was needed on this type.

Sixty-four per cent. of this type were overhauled bec
their normal running time had expired, 20% because t
were crashed (not from engine failure), 10% on account
bearing troubles, and 6% on account of miscellaneous defe

Water-cooled engines "B" and "C" gave very similar fig
for maximum life. Their average life was distinctly lo
and much smaller percentages (35% and 25.5%) were o

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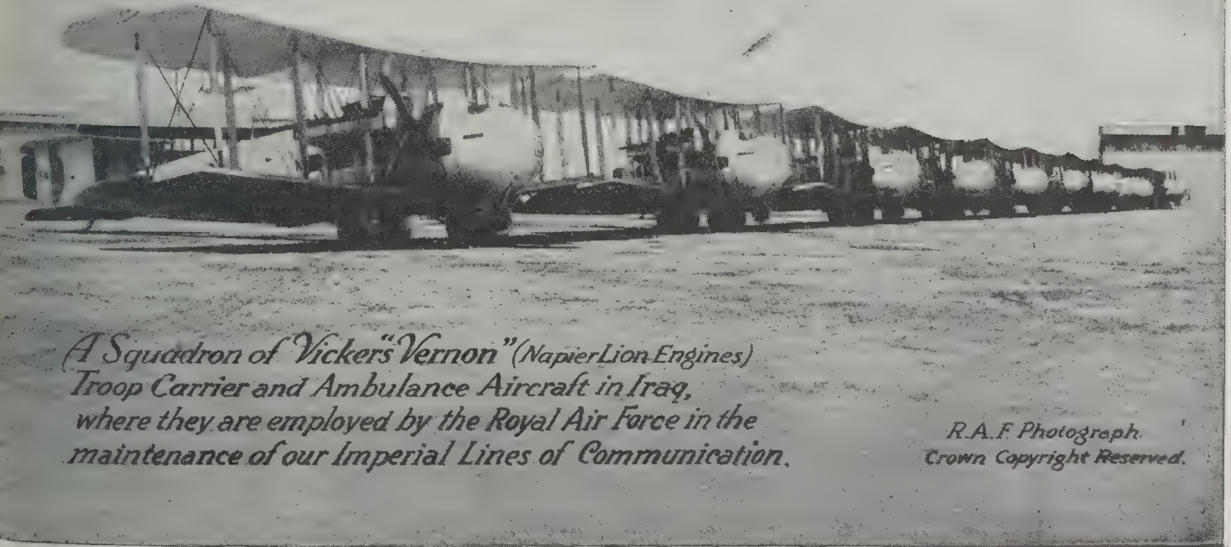

A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph.
Crown Copyright Reserved.

hauled only because they were due for overhaul. The percentage of miscellaneous defects was much higher than for "A."

Water-cooled "B" has been in service nearly as long as water-cooled "A," and is not so good an engine. "C" is an engine of later date, less well known to pilots and mechanics, and is still being modified in detail. In other words it is still suffering teething troubles.

Of the air-cooled engines few have been handled by Henlow as the type generally could readily be overhauled by squadrons. The maximum life of new air-cooled engines before overhaul was higher than the corresponding maxima for water-cooled types. The average life to first overhaul was roughly double that of the water-cooled type, and the man hours per overhaul from ½ to ⅗ of those needed for water-cooled types. Bearing troubles were few, and the percentage of engines overhauled because their time had expired was 60%, 82%, and 76% for the three types.

In conclusion Wing Cdr. Fowler said that the engine of the future must be one which could be repaired by the squadrons using it. At present the cost for transport of engines for overhaul was a big item. The time wasted in transport was important. In overseas units an engine might spend nine months or a year between despatch for repair and return to service, and this meant large expenditure on spare engines.

If repair in squadrons could be universal the money saved on these items would serve to increase the number of squadrons.

He queried if the development of engines was going along the right lines. Was it satisfactory that an engine with careful nursing should run at most 400 hours? From a Service point of view the need for engine repairs was an unmitigated nuisance.

We had gone a long way on the weight per h.p. basis and he thought it time we began to consider rather the number of hours an engine could run with the minimum of attention and the ease with which it could be overhauled.

The Discussion.

Mr. Roy Fedden, opening the discussion, said the lecturer's statement as to the importance of engine repairs in war was arresting and could be compared to Sir Hugh Trenchard's statement concerning the supreme importance of the replacement of aircraft in the first months of an air war. He believed that the air-cooled radial engine went far to meet both difficulties—it could both be repaired and produced more rapidly than other types. It was obvious that Service personnel could not do repairs as efficiently as civilians, because Service personnel could not have the specialised training possible in civil factories, but the extent to which this handicap could be overcome was one bound up with the policy of the Air Staff.

The figure given by the lecturer for the life of aero-engines in Service use was depressing. But it seemed to be based on the 12-year-old Liberty, and he thought they could beat 100 hours to-day easily. At any rate civil aircraft operators were regularly getting 250 hours between overhauls and thinking of putting their overhaul period up to 500 hours.

They were to-day producing engines weighing 1.75 lbs. per h.p. They had reached .75 lbs. in experimental engines and to get such results they had to resort to methods of manufacture which caused one well-known motor-car engineer to describe aero-engine production as a "pathetic failure." The problem of getting to engines with a life of 1,000 hrs. lay largely in the domain of official policy. It took two to three years to develop a new engine and they had to shape their policy in design for the future on what they knew of official policy to-day.

If the authorities made it clear that problems of life, ease of repair, etc., would be given as much importance as performance they could shape their design policy accordingly.

Rear-Admiral W. R. Parnall thought that Henlow resembled rather a mass-repair depot than a training establishment. He admired the ingenious tools and jigs which Henlow had produced which reflected great credit on the R.A.F. technical officers concerned.

Maj. Bulman said the author raised questions both of personnel and of design. He agreed that factors other than efficiency and output had to be considered. Performance was spectacular, and ease of repair tended to escape notice. It must however be given due weight. He felt a little uneasy about the training given at Henlow to Service mechanics. They seemed to cater for men of limited intelligence, by making them work to jigs and tables of limits. This was all right in a depot but what was a man who only knew that the standard clearance on a given part was .005 ins. to do if in the field and away from jigs and tools he found such a component had .006 ins. or .004 ins. clearance? Judgment—and the ability to decide what would result from such a variation—called for a more general form of training was more valuable in emergencies than thorough knowle of any routine. He rather thought that the best man to onto aero-engine work was one who never saw an aero-eng during his training.

Wing Cdr. T. R. Cave-Browne-Cave agreed with Ma Bulman as to the superiority of the all-round engineer to routine-trained mechanic. But where were they to get engineers in war? They must have routine-trained to do routine work.

Col. W. Briggs thought the figures for engine life und depressing. Rolls-Royce Eagle engines were showing li of 800 hours or so as regards bearings, despite the age of type. Engine life was increasing although the weights w coming down. What the engine-maker wanted was defi information as to the causes of trouble.

A considerable number of other speakers took part in discussion which went on till a late hour, but the above a representative sample of the sentiments expressed.

STEEL TUBING.

Quite one of the most important developments in metal construction of aircraft is the evolution of steel tr to two new Air Ministry specifications. These have b produced by the Reynolds Tube Company, Hay Hall Wo Tyseley, Birmingham. The first of these is known D.T.D.91. It is of high manganese steel, with a ten strength of 45-50 tons per square inch.

The second is known as D.T.D.89, and is used for weld The tensile strength of this is 25 tons per square inch *a welding*. The aircraft constructors who have used this la type speak in enthusiastic terms of it. Mr. Roy Chadw of A. V. Roe and Co. Ltd., told one recently that weldin is as easy as working putty.

The Hay Hall works are one of the best arranged w one has ever seen, and at the moment they are in full duction of the new tubing. In addition, the firm is gaged in the production of all the steel tubing of the air R.101, which is now in course of construction at Carding

The name of Reynolds has been associated with highest grade of steel tubing since the early days of bic construction, and their experience and reputation ar guarantee for the high quality of their products.—G. D.

ALL THE WORLD'S
AIRCRAFT, 1927.

Edited by C. G. GREY. Compiled b
LEONARD BRIDGMAN.

"This annual volume has long since established itself as an authoritative and complete record of the aircraft of the world and the 1927 issue is more than ever a necessity to every student of military and civil aviation."—*Times.*

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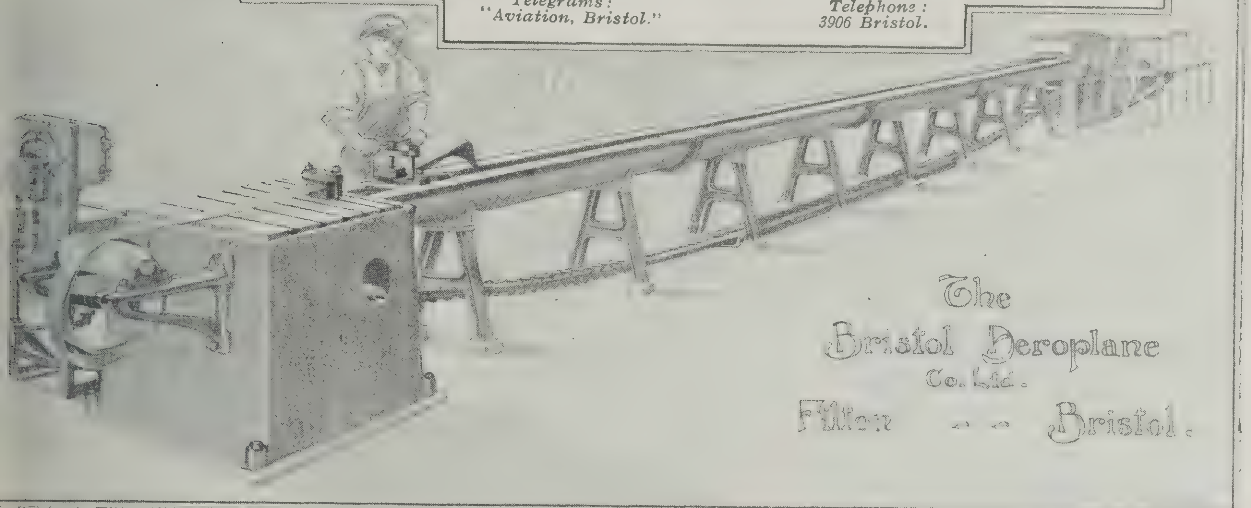
METAL AIRCRAFT.

No. 2.—The Draw Bench.

The draw bench, which is 40 feet in length, is used for forming sections from flat metal strip. It consists of an endless chain by means of which the strip is drawn through a die, or series of dies, at a speed varying from 10 to 20 feet per minute. The maximum safe pull allowable is 5 tons, a 5 h.p. motor being used. The draw bench is also used auxiliary to the rolling mill in the preparation of complex sections.

Telegrams: "*Aviation, Bristol.*"

Telephone: *3906 Bristol.*



BY APPOINTMENT TO HIS MAJESTY THE KING

Some 1927 Successes of the KLEMM DAIMLER Light Plane L.20 *achieved on Wakefield CASTROL "R"*

March	Record Height of 6,250 metres reached by Dr. V. Langssdorf.
May	Flight Stuttgart, Copenhagen, Hamburg, Breslau, Stuttgart. Flight Stuttgart, Gotenburg, Berlin, Stuttgart.
June	Flight Stuttgart, Berlin, Brussels, London, Stuttgart. International Light Aeroplane Competition, Brussels. The L.20 reached a greater height than the winner of the Belgian King's Cup and Belgian Aero Club Cup.
August	International Aero Meeting, Zurich. Two Prizes.
September	International Tournament, Copenhagen. Marine Lt. Larsen won First Prize and King's Cup for Speed.
Autumn	Sachsen Competition, 1927. Six Klemm Daimler L.20 Light Aeroplanes won the 4-9, 500 Km. Circuit prize, and the 10,000 Mile Engine Prize. Rhein Flight Tournament, 1927, Cologne. Two First Prizes.

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TOWARDS PORTUGUESE INDIA.

Mr. C. E. Bleck, of Lisbon, whose flight from Stag Lane to Lisbon was recorded in THE AEROPLANE of Feb. 1, has started a flight to Goa, Portuguese India.

On the morning of Feb. 9 Mr. Bleck left Alverca aerodrome, Lisbon, on his D.H. Moth C-PAAA. and flew nonstop to Melilla, on the Rif coast (Spanish North Africa), in six hours.

On Feb. 10 he went on to Oran, escorted by a flight of Spanish military aeroplanes, in 1 hour 40 minutes.

On Feb. 11 he flew from Oran to Algiers.

On Feb. 12, despite a head wind of 80 km. (50 miles) p.h., he flew on to Bizerta in four and a quarter hours.

The wind having risen still more on Monday, Mr. Bleck wisely decided not to proceed on that day, as the next stage meant a long sea crossing, or a big detour over inhospitable country.

AN OFFICIAL MOTH.

A D.H. Moth (Cirrus II engine) has been ordered by the Air Ministry for the personal use of the Director of Civil Aviation.

Air Vice-Marshal Sir Sefton Brancker is at the moment taking a refresher course in flying.

The Departmental Moth will carry the registration marking G-EDCA, the last three letters of which stand for "Director of Civil Aviation."

Such kindly consideration in providing adequate visual warning of the arrival of the Air Vice-Marshal will no doubt be appreciated by all those who feel it their duty to be present on the aerodrome in time to see him alight.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1]

Report for week ending Feb. 12.

Flying Time 20 hr. 50 min. *Dual Instruction* 9 hr. 5 min. *Soloists* 8 hr. 50 min. *Passenger Flights* 2 hr. 55 min. *Dual Instruction.—With Mr. F. G. M. Sparks*—Messrs. W. L. M. O'Connor, G. E. Gotheridge, Rich Hayes, Mrs. Fraser, Mr. H. M. Samuelson, Miss Fletcher, Messrs. L. Brewster, E. A. Lingard. *With Mr. S. L. F. St. Barbe*—Miss Wilson, Messrs. J. M. Edwards, W. L. M. O'Connor, H. B. Michelmore, A. O. Wigzell, A. L. A. Petty, H. W. Marlow, S. Hansel, L. Rowson, L. Rowson, G. E. Clair. *Soloists.*—Messrs. H. B. Michelmore, R. Sanders Clark, G. E. Murrell, H. M. Samuelson, B. B. Tucker, E. E. Stammers, O. J. Tapper, G. H. Craig, J. H. Saffery, G. W. Hall, A. G. B. Alderson, E. E. Freeson, J. J. Hofer, W. Hay, D. H. P. Esler. *Passenger Flights.—With Mr. F. G. M. Sparks*—Mr. T. E. Miller, Miss Cholmondeley, Mr. J. C. V. K. Watson, Mrs. Davis. *With E. E. Stammers*—Miss V. Cholmondeley. *With O. J. Tapper*—Miss H. Cholmondeley. *With G. H. Craig*—Mr. S. O. Bradshaw. *With A. G. D. Alderson*—Mr. R. C. Presland.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Feb. 11.

Flying Time 12 hr. 50 min. *Instruction* 5 hr. 35 min. *Soloists* 4 hr. 40 min. *Passenger Flights* 1 hr. 30 min. *Tests* 1 hr. 5 min. *Instruction.—With Mr. Baker*—Messrs. Anderson, Secker, Gort, Goss, Davison, Weale, Cohen, Hall, Tweedale, Benson, Harber, Stern, Michelson. *With Mr. Cantrill*—Messrs. Rowley, Meads. *Soloists (under instruction).*—Messrs. Caldecott, Browning, Ruddy. *Pilots.*—Messrs. Goodfellow, Meads, Rowley, Michelson, Nelson, Gattrill, Twemlow, Lacayo. *Passengers.—With Mr. Lacayo*—Mr. Ogden, Mrs. Ogden, Mr. Mills. *With Mr. Twemlow*—Mrs. Twemlow. *With Mr. Cantrill*—Mr. Faulkner, Miss Dewhurst, Mr. Alderson, Mrs. Chadwick.

Notes.—Still this aircraft shortage! QL is due back in the fold this week, but RR having had all her "big-endses" put right has now got a badly cracked cylinder, while MQ is not yet back from Shrewsbury. In any case the weather has been almost Liverpudlian! On Tuesday Messrs. Brown and Cantrill tried to get through to Scotland on an Avian, but were forced back by storms near the Border. On Saturday a Renault Avro got through from Southport, having taken 100 minutes to cover 40 miles and having all the fabric stripped off the airscrew by rain en route. Wotaylaif!

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, Yorks.]

Report for week ending Feb. 11.

Flying Time 3 hr. 25 min. *Instruction* 35 min. *Soloists* 2 hr. 50 min. *Instruction.—With Mr. Beck*—Mr. Clayton. *With Mr. Stockbridge*—Mr. Ostler. *Soloists.*—Messrs. Humpheries, Ellison, A. Crowther, H. Crowther. *"A" Pilots.*—Messrs. Dawson, I. Thomson.

We wish to take this opportunity to thank all those Clubs for their kind messages of condolence in connection with our fatal accident last Sunday. Mr. Critchley was one of our most popular members although only recently joined. He was a pilot of exceptional ability and intended to make application for his "B" Licence right away. One can only attribute the accident to an extremely unexpected error of judgment on his part, in fact he was well out of the spin and another 50 ft. would have been out of the dive. The Club closed down on Thursday and Mr. Little, Mr. Beck and some of the members attended the funeral at Bolton.

For the rest of the week we have had nothing but high gales and storms.

The Club Dance is being held at the Riley-Smith Hall at Tadcaster on Feb. 29 from 8 p.m. until 2 a.m. Supper will be served from 10.30 p.m. and the tables will be arranged round the dance floor. Tickets may be obtained by application to Mr. Beck at the Aerodrome, 10s. 6d. inclusive. It is hoped that at any rate our neighbours, N castle and Lancashire, will come over in large numbers.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth, Birmingham

Report for week ending Feb. 11.

Flying Time 6 hr. 30 min. *Dual.—With Mr. McDonough*—Mes D. Wynn, R. Baker, H. Lattey, G. Robson. *Soloists.*—Messrs. H Willis, S. H. Smith, E. J. Brighton, R. L. Jackson, W. Swann.

High winds again restricted flying this week.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Feb. 12.

Flying Time 10 hr. *Instruction* 5 hr. 45 min. *Soloists* 3 hr. 40 *Passenger Flights* 25 min. *Tests* 10 min. *Instruction.—With Flt. F. A. Swoffer*—Mrs. Ranald, Mr. Lowe-Wilde, Capt. Kirby, Mes Perfect, Shepherd, Watson-Taylor, Fawkes, Richardson, Wells, Cour Parker, Oliver, Curtis-Nuthall, Fagan, Scott-Hall. *Soloists.*— Ranald, Capt. Kirby, Messrs. Bowen, Cripps, Shepherd, Wells, L Wilde, Parker, Oliver, Fagan. *Passenger.—With Mr. Oliver*— Oswald.

Flying was only possible on two days this week, Thursday Sunday. On the other days there were strong westerly gales and Mr. Lowe-Wilde made a successful first solo. During this week the Avro Avian was in commission; both our Moths are b reconditioned.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwic

Report for week ending Feb. 12.

Flying Time 9 hr. 55 min. *Instruction.—With Mr. Lines*—M G. Watson Parker, N. Lindley, A. A. Rice, N. Brett. *Soloists.*—Me W. P. Cubitt, F. Gough, A. A. Rea, R. T. Harmer. *Passengers.*— Edwards and Mr. A. Bagshaw.

Notes.—The weather during the past week has been shocking yet quite a lot of enthusiastic members have braved the elem and juggled with the "joy stick." Sq. Ldr. Rea gave a very lecture on Wednesday evening in the Club House and the next we have one we must hire a large hall.

We have pleasure in giving welcome to two prominent citizens week. They are The Lord Mayor of Norwich and Sir Ge Chamberlin—both have joined the Club. The Lord Mayor and Mayoress are going to honour us with their company on the Applications for membership continue to come in and our outw mail is being swelled by receipts for subscriptions, which is cheering.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Feb. 12.

Flying Time 7 hr. 35 min. *Instruction.—With Mr. Lowdell*— Edwards, Miss Creasy, Messrs. S. Schofield, K. Peck, F. Ve H. Billinton, A. Westwood, F. Jolly, R. Brown. *Passengers.*— *Mr. Lowdell*—Miss Rose, Mr. C. Hanson. *With Mr. Prentice*—M T. Marriage, F. Dyson, B. F. Marriage, J. Lancaster, F. J *Soloists.*—Dr. Jas. Sleigh, Messrs. S. Schofield, C. N. Prentice.

Notes.—After a week of rain and gales which had held up all f and caused consternation to the Finance Committee, Sunday a really spring-like day. A Moth, Widgeon, Bluebirds and va other birds arrived in full force. The aerodrome had all the ap ance of a miniature Display. Our President, the Hon. Lady B flew down in a Moth; Mr. Blake arrived in a demonstration Blue and Mr. Penrose in a Widgeon. Formation flying, loops, rolls, and joy-riding attracted a number of visitors.

Forthcoming Display.—A meeting of the Display Committee was on Sunday evening and Mr. H. Billinton was elected Chairman Mr. C. Hanson Secretary.

It has been definitely decided to hold a two-day Display on E Sunday and Monday, Sunday to be devoted to joy-riding and exhit flying and on the Monday air races, bomb dropping, pageant of t etc. Will all Private Owners and others interested kindly not date; we shall be very grateful for any assistance in connection this.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Feb. 11.

Total Flying 9 hr. *Instruction* 5 hr. 35 min. *Soloists* 1 hr. 50 *Passengers.—With Mr. Tapp*—Miss Johnstone and Mr. Spooner. *Mr. Bartlett*—Mr. J. E. L. Bartlett. *Under Instruction.*—Major E Messrs. Garnett, Bryan, T. H. Clarke, Roberts, Tanner and A *Soloists.*—Messrs. J. E. Tratman, E. Hopper, and T. H. Clark.

Mr. T. H. Clarke did his first solo flight this week. Flying been possible on three days only and for a short time on ea those days. As this disheartening weather appears to be g throughout the country, we do not feel that we are falling b other clubs in the matter of flying done.

THE FLYING SCHOOLS.

The Henderson Flying School.

Report for week ending Feb. 11.

Flying Time 5 hr. 25 min. *Dual Instruction* 4 hr. 25 min. *S* 30 min. *Dual.—With H. D. Davis*—Messrs. Philipson, Ad Whiteley, Crabtree. *Soloist.*—Mr. Crabtree.

This has been the worst flying week since Jan. 1 owing t weather and bogged aerodrome.

Since Jan. 1, 1928, Mr. H. D. Davis, A.F.C., has taken char flying operations and the flying time up to Feb. 13 totals 48 hr. 35 dual instruction, and 4 hr. 55 min., solo.

Mr. A. A. Anderson has just returned from the South African b of the Company and taken charge of the other affairs of state. School has been completely reorganised and within a week o should be able to show some real good results.

Despite the bad weather and floods, etc., Mr. Grierson and Crabtree have been launched solo. Mr. Grierson left for R.A.F., well, and Mr. Crabtree is now our "Star turn" and proposes in for his "B" Licence.

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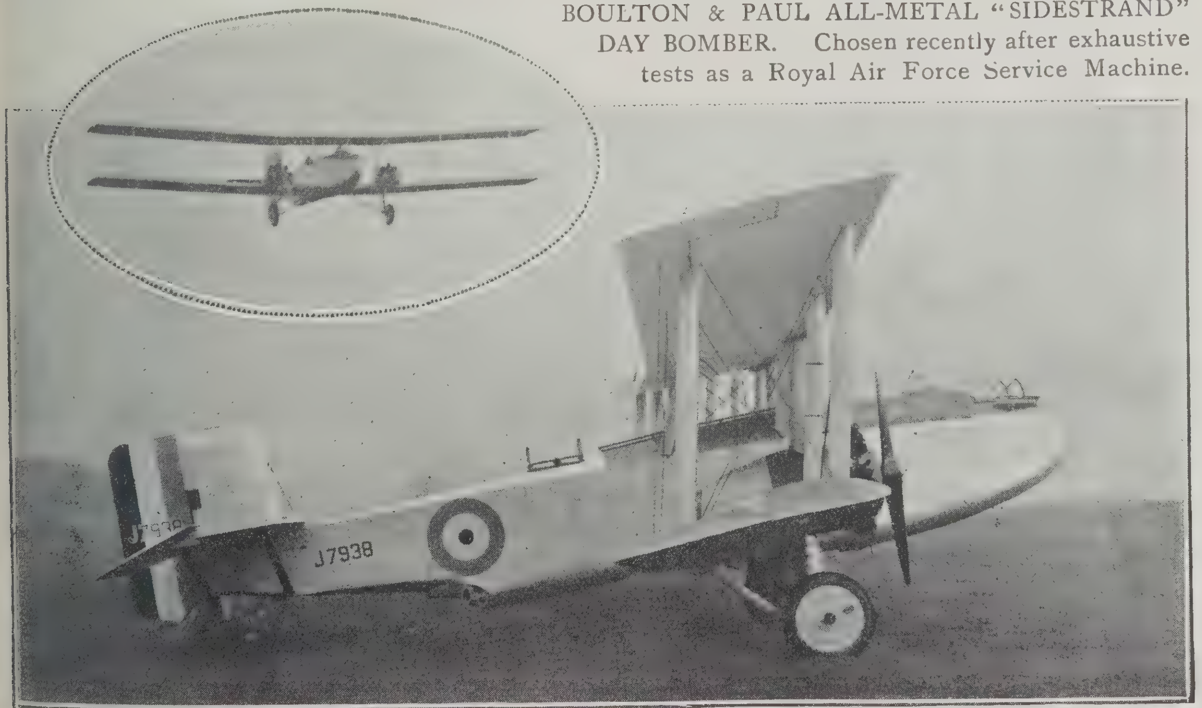

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 15; Tuesday, 21; Wednesday, 14; Thursday, 18; Friday, 11; Saturday, 7; Sunday, 7.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 37, passengers 197, freight 13 tons.

Air Union:
Paris—London: Machines 22, passengers 63, freight 10 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 13, passengers 31, freight 4 tons.

Sabena:
Brussels—London: Machines 9, passengers 5, freight 1½ tons.

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 10, passengers 7.

Private:
Machines 2, passengers 2.

Total number of trips by British Machines, 37, carrying 197 passengers. Foreign Machines, 54, carrying 106 passengers.

COMPARATIVE FIGURES.

Week ending Feb. 12:
Machines, 93; Passengers, 305; Crews, 171; Total personnel, 476.

Corresponding week, 1927:
Machines, 51; Passengers, 114; Crews, 84; Total personnel, 198.

Corresponding week, 1926:
Machines, 40; Passengers, 88; Crews, 51; Total personnel, 139.

Corresponding week, 1925:
Machines, 61; Passengers, 78; Crews, 70; Total personnel, 148.

Corresponding week, 1924:
Machines, 50; Passengers, 86; Crews, 78; Total personnel, 164.

Corresponding week, 1923:
Machines, 26; Passengers, 75; Crews, 49; Total personnel, 124.

Corresponding week, 1922:
Machines, 30; Passengers, 57; Crews, 47; Total personnel, 104.

Corresponding week, 1921:
Machines, 20; Passengers, 32; Crews, 35; Total personnel, 67.

Croydon Notes.

Mr. Van Lear Black, who returned to Croydon on Tuesday, Feb. 7, from Berlin, arranged to depart again for the Riviera on Friday, Feb. 10. For the first time in his experience of flying he was unable to start to schedule. The weather on that morning was too thick for even Mr. Geysendorffer, and the gale which sprang up in the afternoon made it advisable to postpone the journey.

The weather on Saturday was even worse and Mr. Black did not leave until Sunday morning, Feb. 12.

This one failure to start to time in 44,000 miles of flying is a very fine testimonial to the K.L.M. organisation responsible for all Mr. Black's flying arrangements.

The line squall which struck Croydon about 16.40 hours on Friday afternoon came at a convenient time. Imperial Airways' Argosy G-EBLF, which came over from Paris that afternoon, was safely in its shed just a few minutes before, and the Luft-Hansa Junkers D 877 arrived a few minutes after the worst of it was over. No machine caught on the ground in that particular squall could have escaped serious damage.

Unfortunately G-EBLF's luck did not hold, for on the next day a squall of nearly equal severity caught her on the tarmac, and damaged her considerably. The tail unit is severely knocked about, and the machine will certainly be laid up for several days for repairs. As Argosy G-EBOZ is at present under complete overhaul, Imperial Airways have only one machine of this type—G-EBLO—in service.

The gentle hint in Croydon Notes of last week as to the excessive zeal of the aerodrome police in keeping visitors out of the aerodrome may or may not be responsible, but there seems to be some relaxation of their supervision over visitors this week.

Rumours of wholesale engagements of new pilots by Imperial Airways are not without foundation. They have actually engaged one, and negotiations with others are in progress.

The one so far definitely engaged is Flt. Lt. A. E. Woodbridge, R.A.F.O. Mr. Woodbridge served with distinction in the R.A.F. during the war. After the war he served with No. 216 Squadron at Heliopolis (February, 1920—February, 1924), No. 55 (Bombing) Squadron (April, 1924—June, 1926). He was transferred to the Reserve on Nov. 1, 1926, but was temporarily re-employed in the R.A.F. again with No. 58 Squa ron until Feb. 1, 1928, when he was released to join Imperi Airways Ltd.

THE RETREAT FROM MOSCOW.

Mr. Van Lear Black's wish to fly to Moscow, recorded last week's The Aeroplane, was not fulfilled. On arrival Berlin he was informed that Russia was mainly fog, fro and snow-bound. In addition a distinct lack of cordiali as to his visit was shown by the Soviet authorities, so t trip was abandoned.

Mr. Black returned from Berlin, on H-NADP, on Tuesda Feb. 7. The trip to Croydon was made without a stop.

AIR MAIL TO AND IN THE DUTCH EAST INDIES.

The K.L.M. company have now made definite arrangemen to run a regular air mail service between Batavia and Sur baya, Dutch East Indies.

An experimental weekly service, run by the Colonial Se tion of the Dutch Army Air Service, was started in July la year to connect with the incoming and outgoing mail boa from Batavia, and to make it possible for residents in San rang and Surabaya to reply to letters from Europe by t return trip of the steamers which brought the original lette

This experiment proved so successful that it has been d cided to place a contract with the K.L.M. for a permane service, which, it is hoped, will begin to operate early th summer.

It is definitely decided that three-engined Fokker machin —of the FVII-3m type, with Armstrong-Siddeley Ly engines—are to be used.

In addition to the service in the Dutch East Indies, t K.L.M. hope during the coming summer to institute a reg lar service once a month each way between Holland a Batavia.

This decision is a result of the very successful flight fro Amsterdam to Batavia and back in 28 days made by Lie Koppen, of the Dutch Army Air Service, during last Octob Lieut. Koppen on that occasion used the same type machine and engine (Fokker F.VII-3m, Armstrong-Siddel Lynx) as will be used for the regular service.

It will be exceedingly interesting to discover what attitu the Persian Government will take up in regard to th service. If it is permitted to use the Persian Gulf route as Lt. Koppen did—the Persian refusal of facilities for I perial Airways proposed Basrah—Karachi service will assu a new aspect.

A NEW U.S. NIGHT AIR MAIL SERVICE.

On Feb. 1, the Chicago—Dallas, Texas, air-mail rou operated by National Air Transport, Inc., was changed o from a day to a night schedule.

This route, 995 miles long, is equipped with seventy-five inch revolving electric beacons with many intervening smal flashing lights and is the second lighted air-mail route to operated in the United States, the first having been the Tra Continental route on which night flying has been in operati for three years.

The mail plane will leave Chicago at 20.00 hours and arr at Dallas at 08.00 hours and on the return trip it will lea Dallas at 19.00 hours and arrive at Chicago at 07.00 hours

It is estimated that the new night service will save proximately twenty-four hours in the delivery of mail alo the route.

On the same date a regular passenger, mail and expr day service was inaugurated between Chicago and Kan City.

At the present time National Air Transport, Inc., fl approximately 5,000 miles in every 24 hours. With the chan over from day to night service 3,400 of the 5,000 miles w be flown at night.

A CHICAGO RUBBERNECK SERVICE.

National Air Transport, Inc., of Chicago, Ill., which co pany operates the Chicago—New York and the Chicag Dallas air-mail routes, has formed a subsidiary compa known as the NAT Flying Service, Inc., with headquart at the Chicago Municipal Airport. This company will und-

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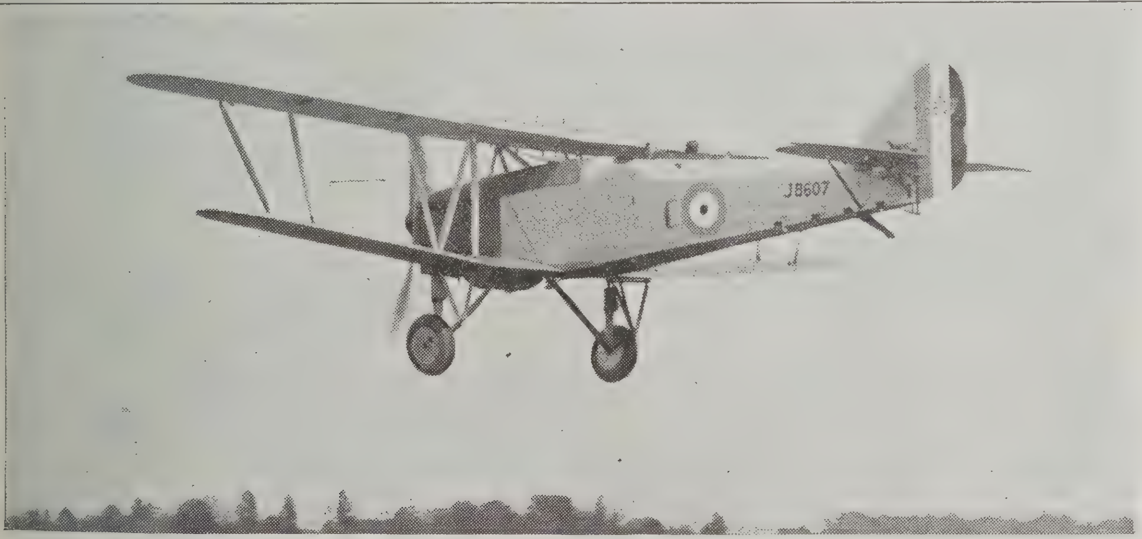

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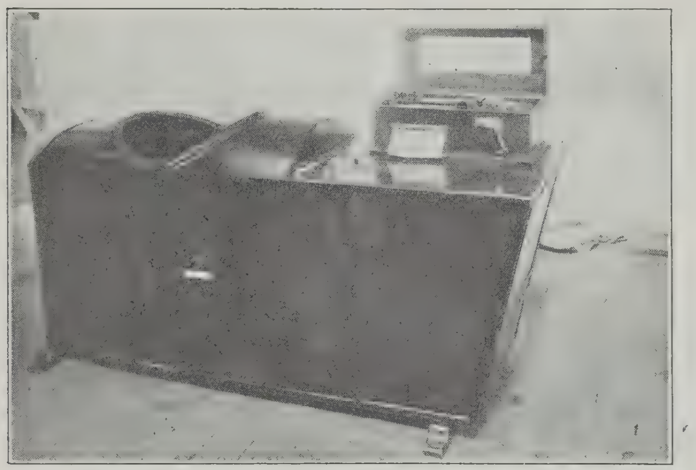

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monoplane for the sight-seeing service, and a Travel
four-passenger single-engined monoplane for the taxi
cross-country service.
Three regular sight-seeing trips will be made daily
will follow a definite route over the city and its environs
spieler will be on hand to put across the rubberneck do

LYNX ENGINES ABROAD.

The *Avio Linee Italiene S.A.* of Rome will shortl
augurate an air-line between Milan and Munich. The
vice will operate with Fokker FVII-3m monoplanes,
fitted with three 200 h.p. Armstrong-Siddeley Lynx eng
of the type identical to that used by Lieut. Koppen on
flight from Amsterdam to Batavia and back last Octob
This service is only 225 miles long, but on this s
route it will be necessary for the aircraft to reach a he
of 12,000 feet to fly over the Berganese Alps.
It is now announced that the service to be operate
the K.L.M. in the Dutch East Indies between the isl
of the Malay Archipelago will also use Fokker FVI
monoplanes with three Armstrong-Siddeley Lynx engi
The *Compagnie Aérienne Française* is about to take
livery of a Nieuport-Delage cabin aeroplane fitted wit
Armstrong-Siddeley Lynx engine.

THE HANDLEY PAGE SLOT IN FRANCE.

The French aircraft constructor, François Villiers, o
Rue d'Arthelon, Meudon, has obtained the licence for
Handley Page Slot in France.
The first machine constructed by this firm to be f
with this device, a two-seat night fighter, fitted with a 450
Lorraine-Dietrich engine, has been delivered to Villaco
for test by the *Section Technique et Industriel de l'A
nautique.*
It made its first flight on Feb. 8 piloted by M. Desc
and the machine showed itself to possess a remarkable
formance with a wide speed range, and a low landing s
followed by a very short run.

THE PRATT AND WHITNEY WASP IN GERMA

It can now be stated on reliable authority that
Bayerische Motoren Werke A.G., of Munich, the make
the well-known B.M.W. water-cooled engines, have se
a licence for the manufacture in Germany of the Pratt
Whitney Wasp air-cooled radial engine of 425 h.p.

NEW COMPANY.

REID AND SIGRIST LTD.—Private company. Registered Feb. 6,
Capital, £4,000 in £1 shares. Objects: To acquire from G. H.
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the business of manufacturers of and dealers in aeroplanes, air
aero-'buses and all other machines or devices for aerial navig
etc. The permanent directors are: G. H. Reid (chairman), 15, Ga
Mansions, Church Row, Hampstead, N.W., Squadron Leader (R
(retd.). F. Sigrist, Broom Hall, Oxshott, Surrey. Eva A. Mai
address not stated. Remuneration: £50 each per annum. Solic
Kenneth Brown, Baker, Baker, Lennox House, Norfolk Street, S
W.C.2.

PERSONAL NOTICES.

DEATH.

CHALMERS.—On Feb. 8, at Emsworth, Hampshire, as the res
a flying accident, Peter John Basil Chalmers, Plt. Off., R.A.F.
Peter Chalmers was the only son of Mr. Robert Chalmers,
the pioneers of European Aviation, who built the Dutheil-Ch
engine in Paris in 1908, and is now known as the head
Tecalemit firm. He passed out of Cranwell last December,
joined the Cadet College from Harrow.
In every way Peter Chalmers was of the type which is most
able in the Royal Air Force. He was an excellent example
English public school boy. He was a fine athlete,—he ran sec
J. H. Mott of Sandhurst in the Inter-Cadet College Sports at
Club last Summer. He had highly-developed mechanical taste
had a strong sense of what is expected of a young officer in the
Service. And he liked flying. Men of his kind can ill be
from a Service such as the R.A.F. which is still in the maki
His many friends in Aviation both in this country and abroa
offer their deepest sympathy to Mr. Robert Chalmers i
loss.—C. G. G.

FORTHCOMING MARRIAGE.

SOUTHEY—DAVIES.—The engagement is announced b
Harold F. G. Southey, Flg. Off., R.A.F., only son of the late
Southey and Mrs. Southey, of St. Christopher's, Clevedon, So
and Joan M. G. Davies (Joe), elder daughter of Mr. and
Harold B. Davies, of 27, Park Mansions, Knightsbridge.

BIRTHS.

ALLCROFT.—On Feb. 10, at Sowberry Court, Moulsford, th
of John D. Allcroft, Plt. Off., R.A.F.—a son.
SCHOFIELD.—On Feb. 10, at Bicester, Oxon, to Margery,
Flg. Off. H. M. Schofield, R.A.F.—a son.
SOUTHWELL.—On Feb. 7, at Trumpington, Cambridg
Warburton, wife of R. V. Southwell—a daughter.

PURE GAS.

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C.G.Grey

Vol. XXXIV. No. 8. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"ORDER FOR SEA IS GIVEN,
THEY HAVE PUT FORTH THE HAVEN."—SHAKSPEARE—(*Antony and Cleopatra.*)

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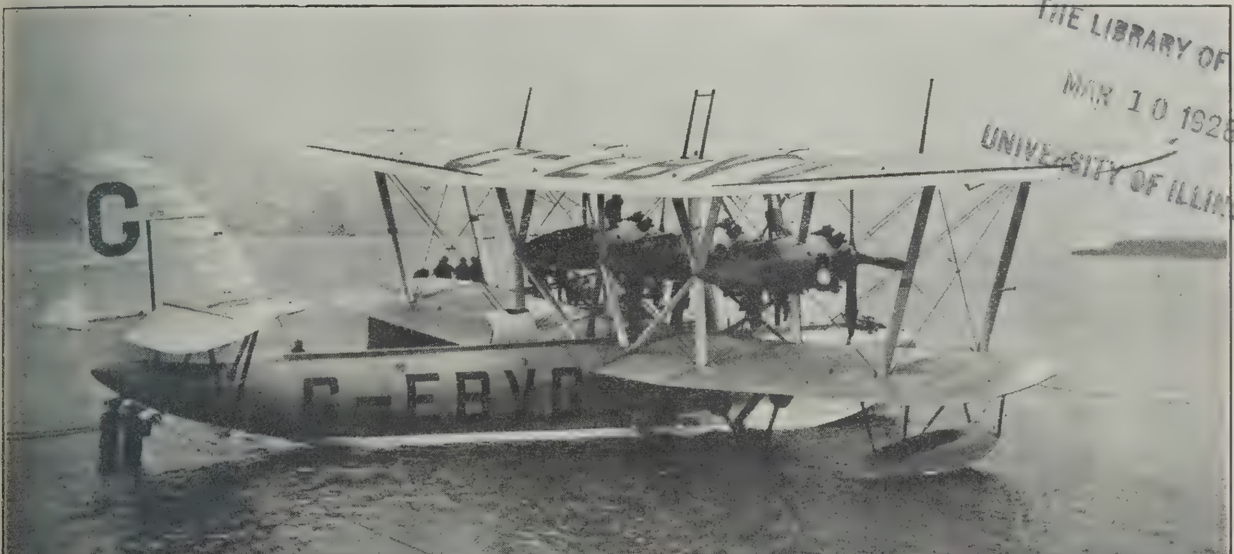

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ON Feb. 7, 1928, Mr. Bert Hinkler, in the Avian, left London and on Feb. 14 arrived at Karachi, India.

The "Aeroplane" describes this flight "as by far the finest achievement in long distance flying that has ever been made."

THE following are some of the AVIAN'S remarkable achievements. The same machine, fitted with a "Cirrus" engine, and piloted by Mr. Bert Hinkler, was used in each case.

FIRST NON-STOP FLIGHT—LONDON to RIGA.

On August 27, 1927, the Avian flew non-stop from London to Riga, 1,200 miles, at a speed of over 100 m.p.h.

FIRST NON-STOP FLIGHT—LONDON to ROME.

On February 7th, 1928, the Avian flew non-stop from London to Rome, 1,100 miles.

FIRST NON-STOP FLIGHT—RAMLEH to BASRA.

On February 12, 1928, the Avian flew non-stop from Ramleh (Palestine) to Basra (Mesopotamia) 950 miles, in 9½ hours.

All on the same machine—the Avro Cirrus-Avian.

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London Office and Export Dept.: 166, Piccadilly, W.1. *Experimental Works: Hamble, Southampton.*

FEB. 22, 1928.

THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 8.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON AIRSHIPS AND THINGS.

the year 1909, just before the World's first great flying ing, at Reims, a certain sportsman of one's acquaint- was hurrying across France to see this new portent ıe skies. He was driving an old Napier racing car ier engines were fast even in those days), he had a with him in a little bucket seat alongside, and, ıse in those days there were no detachable wheels or there was a stack of spare tyres on the back of the inside of which was curled a little Cockney chauffeur- anic.

ıising along one of the great straight stretches of road Soissons at a steady 60 m.p.hr. they overtook a big ısine and essayed to pass it. At the sound of their the driver of the limousine pulled across the road and nted them from passing. Thinking that this was ly a mistake, the driver of the Napier slowed down, let imousine get ahead, and again accelerated to pass it. n, and obviously deliberately, the driver of the ısine pulled across the road, evidently objecting to g the Napier's dust for the next few miles.

is time the Napier driver grew angry. He let the ısine draw well ahead and then he put his foot hard on the accelerator and kept it there, working the er up to a good 90 miles an hour. A third time the r of the limousine pulled across the road. The Napier r, who is apt to be a trifle irascible at times, "saw ' held his foot down on the accelerator, deliberately ıg the car to the right and rammed the limousine ships.

the limousine was doing about 50 and the Napier was g in the neighbourhood of 90, although in the same tion, the impact was considerable. The two cars went the side of the road locked together and fell into a of standing corn. All that the Napier driver remem- about that is a rain of arms, legs, bodies, tyres and cases rocketting over his head.

ortly afterwards, having become conscious and having sure that he had not broken himself anywhere, he ed round and found his travelling companion close by, comparatively unhurt. Then he started to look for chauffeur.

Seeing the corn waving some distance away he waded towards the spot and there he found the lad struggling to his feet and spitting out blood and teeth. Recognising his employer, the little sportsman spluttered out, "'Ave you killed 'im, Sir? If not, go back and finish 'im wiv a spanner."

The rest of the story is of no particular account. The incident happened near a village and the explosion of everything explodable in the cars brought out the inhabitants, together with the local gendarmerie,—both of whom, having reconstructed the crime, which was fairly obvious, were inclined to be annoyed with the English driver until they discovered that the almost-dead inhabitants of the limousine were, as they put it, only Germans. After which, the Napier crew became the heroes of the village and the whole telephone and telegraphic system of France was put at their disposal so that they might have a new car sent over to them from England forthwith.

AN ALLEGORY.

Now this incident is in a certain sense an allegory. The unfortunate airships, essentially of German origin, have been insensately attacked by one who calls himself Neon and certainly sees red. He himself may now be considered something of a back number, as, one rather thinks, is the highly expensive red light after which he called himself—seeing that Colonel Paul Henderson of National Air Transport Inc., U.S.A., says that he can get better fog-piercing effects for less money out of ordinary electric lights with red glass bulbs. But he has proved in effect to be one of the best friends that Aviation has ever had, by reason of having stirred up so many people to think about aircraft. And his destructive attempts against airships have of late been carried on quite energetically by a certain Mr. Spanner, who may be quite a good Naval architect, though obviously he does not know much about airships.

Mr. Spanner's efforts will probably, in fact, do more good to airships than did the original rabid attacks of Neon. Writing as he does under his own name, with a certain amount of authority as an engineer, as compared with Neon's anonymity, he may be taken seriously and may

VERSATILITY.—A D.H.9 (Nimbus engine) belonging to the Aircraft Operating Co. Ltd. being converted into a seaplane at Livingstone, N. Rhodesia, for use on the Zambesi survey.

make people think more deeply about airships. Which may impel them to take keener interest in the subject.

Also he may have brought up some few serious engineering points which will prove of real value to the actual designers and constructors of our two big airships which are being built at Howden and Cardington, respectively on Capitalistic and Socialistic principles,—that is to say, one by a business firm and one by the Government. Anyhow, one hopes so.

Personally, one has not had time to read Mr. Spanner's books, for a glance at them showed the literary style to be dull, and the subject-matter did not seem worth while, because, Spanner or no Spanner, Neon or no Neon, airships have got to come just as surely as submarines had to come as a natural sequence to the first steamship.

Modern Mrs. Partingtons.

Neon and Spanner can no more stop the progress of airships than George Stephenson's apocryphal cow could stop his locomotive, or than Mrs. Partington could sweep out the roused Atlantic with her mop. Progress never does stop.

No new principle is involved in airships. Balloons float in air just as naturally as ships float on water. And the frames of airships are just as much an engineering job as are the frames of sea-going ships when once the forces applied to them are understood.

The destroyer *Cobra* broke her back in the North Sea,—because Mr. Spanner's predecessors did not know enough about their jobs. And the *Mauretania* was fitted with a new set of propellors every time she came back from America for several years before they found a set which fitted her,—all because Naval architects did not know enough about the streamlines of water.

As that elegant writer, Mr. Elliott Springs, the author of "Nocturne Militaire," has remarked in one of his more recent writings,—

> The modern ocean liner uses no hydrostatic principles that would astound Noah, but it's a lot better than the Ark. Radio is more efficient than a dove, but Noah got his weather report just the same. And I can retain my membership in the prophet's union and still hint that these refinements and improvements will continue.

The Z.R.III which crossed the Atlantic was better than the L.Z.II. And so was the R.38, although she broke in the air, and killed nearly all her crew. So improvements go on improving.

The Danger Point.

Naturally airships will be dangerous for a time. So have all other forms of transport while in their early stages of development. Plenty of the early steamships were burnt at sea or foundered in weather which a sailing ship would have survived. But although we like to make our transport vehicles safer, danger is not going to prevent people from using them.

Even in these days well-found ships founder at sea when they strike a storm of unusual strength. And even when we have developed airships to stand up to ordinarily bad weather, we shall still have one broken now and then by exceptionally bad weather. But, again to quote M Springs,—

> You can see a storm coming a long way off and there's always weather bureau at the other end of the telephone. Did I hear long coarse laugh at the mention of the Weather Bureau? Well th may not be able to tell you exactly when a shower will stop ball game but they can warn you against starting for Chicago wh there's a cyclone on the way from Kansas. The weather bur functions under a Cabinet officer but even a Republican Administ tion hasn't found any way to corrupt an aneroid barometer.

Safety First.

In these matters Mr. Springs was writing about ae planes, but much of his philosophy applies equally to ships. For instance, on the subject of aircraft falling pieces in the air, he says,—

> All sky-riders should wear parachutes. A steamship is requi to carry a life-preserver (*English:*—Life-buoy) for every itiner fish-feeder. No one wants to jump overboard with only a preserver or a parachute between them and *de mortuis nil nisi bon* But if your departure is occasioned by an exploding boiler o missing cotter pin, either one is better than a paid-up insura policy.

Continuing, he says,—

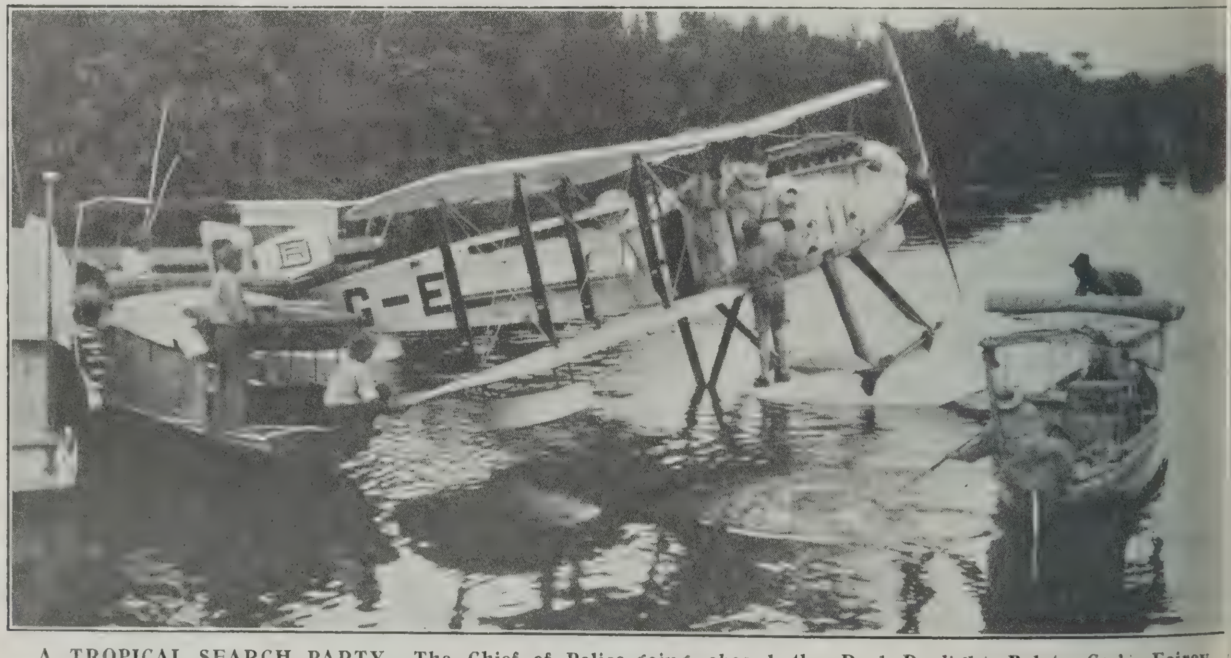
> Mistakes on the ground are not usually so costly as mistakes the air. I have no argument to offer to overcome that drawback am not subsidised by any manufacturer and I am not trying colour facts. In a car, it's a dented fender and notify the insura companies. In a plane, it's silver handles and Hello, Saint Pe But the added risk will never keep the public out of the air more than government poison, of the people, by the people, for Anti-saloon League, will turn the Eighteenth Amendment into Golden Rule.
>
> Don't get the idea that all flying accidents are fatal. Far from We have numbers of automobile and railway accidents in which one is injured. The same is true of airplane crashes. There more people killed by faith in Gordon Gin labels every day t will ever cross the Styx with a broken propeller for an oar.

[Lest this might be construed into a libel, one would plain that the excellence of Mr. Gordon's product leads the U.S.A. to forging of his labels and their being affi to bottles containing wood-alcohol, a deadly poison.—C. G.

Feminine Influence.

Anyhow, even if Messrs. Neon and Spanner mistrust ships, the women of the Nation will certainly give us a l in the air when they have an opportunity of travelling these craft. Again to quote Mr. Springs,—

> I can't give you the pathological reactions, but men are alv more afraid of a plane than women. I've never yet left the gro with a man who wasn't visibly uneasy but I have never taken woman who was worried about anything but keeping her sk down. Usually the women ask me to stunt a little, but the coc of the plane is covered with fingernail marks where various have taken a firm hold when the nose dropped ten degrees.
>
> Once I had to land ten miles from home because the man I up with me got pannicky every time I started to turn around. thought he was in static balance between the quick and the d I got caught in a whirlwind when I had an elderly aunt up for first ride. In landing, we smashed the undercarriage and a w but she only smiled and said she wanted to go up again as as I got the plane repaired.



A TROPICAL SEARCH PARTY.—The Chief of Police going aboard the Real Daylight Balata Co.'s Fairey III.D (Rolls-Royce Eagle) on the Northern Frontier of British Guiana, to search for the missing American aviator, Mr. Paul Redfern.

World Speed Records

with

NAPIER

Aero Engine

Fastest in Air
Fastest on Land

Capt. Malcolm Campbell cables
as follows dated 19th February, 1928 :

"Obtained World's Record to-day, average speed 206.9. Mile in one direction over 214. Conditions bad. Napier engine behaved marvellously."

Capt. Campbell thus wins the £1.000
Trophy presented by Sir Charles Wakefield.

The Schneider Trophy was won for Great Britain with the same type Napier engine.

The World's Air Speed Record over 100 km. is held by the Supermarine-Napier seaplane. Speed 283 313 m.p.h.

D. NAPIER & SON, LTD.,
Acton, London, W.3.

Land Record subject to confirmation by the Official Bodies.

CIRRUS ENGINE

ANOTHER WORLD'S RECORD

LONDON to ROME—1 DA

Mr. Bert Hinkler's remarkable flight on a "**CIRRUS**" engined AVRO "AVIAN" LIGHT AEROPLANE.

THE ENGINE

Mr. Bert Hinkler is now attempting to fly from LONDON to AUSTRALIA in record time on an AVRO-CIRRUS-AVIAN LIGHT AEROPLANE.

On the first day he flew NON-STOP from LONDON to ROME in 13¼ hours.

On the 7th day he reached INDIA (KARACHI).

Such a flight demands the greatest skill and endurance on the part of the Pilot, the highest efficiency of the machine and unfaltering reliability of the engine.

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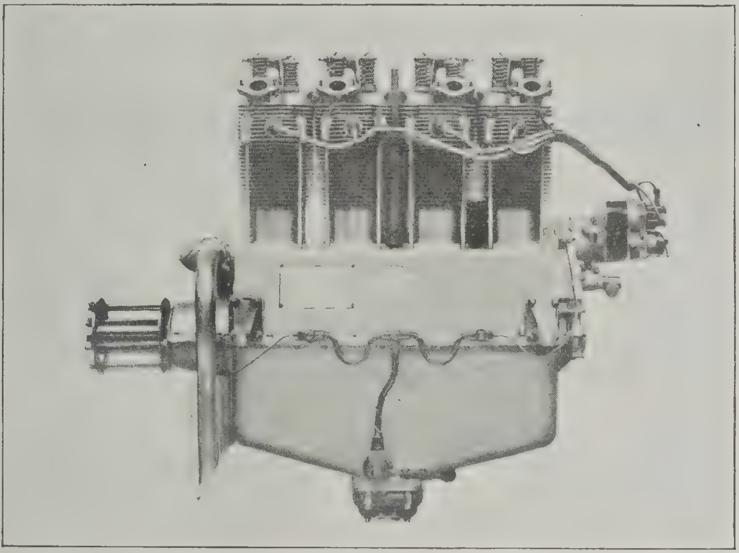

LATEST NEWS, 20/2/28.

Mr. Hinkler has now arrived at SINGAPORE having flown solo approx. 10,500 miles, and cables as follows:

AIRDISCO LONDON.

HINKLER REQUESTS ME INFORM YOU CIRRUS ENGINE LOOKS AND RUNS AS THOUGH IT HAD JUST COME OFF TEST BENCH IN SPITE OF GRUELLING FLIGHT.

LANCASTER.

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LINE LIGHT AEROPLANE ENGINE.

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Constructors of "MARTINSYDE" Types of Aircraft.

Cables
"Airdisco, London"

PROMISING PROPAGANDA.

People are not going to be the least bit afraid of airships when once airships begin giving something like a regular service. Lt.-Cdr. Burney is a pretty shrewd judge of human nature as a whole and of individuals or he would never have got the support he has got in building his first airship. And now reports from reliable sources, as newspaper reports go, say that he has been visiting the United States with a view to arranging for co-operation in the first journey of his ship to America.

The U.S. Navy, with that good sportsmanship which they have always shown, as for instance in connection with the Schneider Trophy Contests, have offered him the use of the mooring mast at Lakehurst. And nobody could say fairer than that.

Over and above all that, the reports say that he has secured enough financial backing among big business people in the States to assure the formation of what looks, at this distance, very like an Anglo-American airship line which would build its own airships. That would be the finest thing that could possibly happen for the development of airships.

PRIMITIVE PROPAGATION.

The real trouble with airships is that the propagation of the species is so slow, partly because of the time they take to build and partly because there has not been enough money forthcoming to push their development. We spent a lot of money on airships during the War, and so did the Germans. But they were all much of a muchness, and they were all hustled War products.

Consequently, not enough time and money was spent on real experimental development work.

Airships breed like elephants and aeroplanes like rabbits. Consequently the airship is many many generations in the process of evolution behind the aeroplane.

Anybody who has any knowledge of aircraft can see quite a long way ahead in the development of aeroplanes. But we are still a very long way from producing the ultimate type of aeroplane. So anybody can understand that the airship of to-day is a very primitive thing indeed.

WETNESS.

Another thing that has hampered the development of airships in the past has been the fact that so many people who have had to do with airships have suffered from a curious mentality which can really only be described by that epithet so popular in the Royal Air Force, the word "wet."

Such people have always a sloppy way of thinking which in their case had the effect of claiming very much more for their beloved airships than airships themselves could possibly perform in the particular stage of development which they had then reached. And all their estimates for everything connected with airships were correspondingly moist.

Possibly the hydrogen with which they had to deal gave them a tendency towards being hydrocephalic. So perhaps when we can produce helium commercially we shall be free entirely not only from danger of fire in airships but from sloppy thinking also.

One remembers that quite a number of years ago there was a great idea of running an airship line to the East, and estimates worked out to the last odd halfpenny were submitted by the airship people in the hopes of inducing the Government to allocate money for their beautiful schemes. These estimates were submitted to a man with a useful critical brain. Glancing through the masses of papers before him, he picked on one sheet which purported to show the cost of a completely-equipped airship shed in a hot country.

Glancing down the figures he said, "I suppose you will want some water at the shed for washing and drinking and possibly for water ballast." "Oh! Of course," said the airship people. "Well I do not see any figures for the water supply in the estimate," said he, "and you will have a good many miles of water-pipes to lay."

Looking a bit further he said, "I suppose you will occasionally want to work in the shed after dark." "Oh! Of course," said the airship people. "Well," said he, "I do not see any allowance for electric light plant or even for cables from the nearest local supply." Later he said, "I suppose you will want to get to the shed either by rail or road and not merely by hauling stuff across open country." "Oh! Of course," said the airship people. "Well, I do not see any allowance for roads or railways or sidings," said he, and added, "You had better take these figures away and bring them back when you have discovered what you really will want."

That, roughly, is the kind of mentality which has had a great deal to do with airships, and the value of airships in the past. But things are in rather different hands in these days. Commander Burney has shown, in his dealings with his hydro-vanes, as well as airships, that he has a very
good business head. And the Government airship expe
ments at Cardington are in charge of some of the b
brains in the employ of the Air Ministry. So even thou
the two airships which are now being built may come
unfortunate accidental ends, we may rest assured that p
vided enough money can be got together to go on w
the experiments, we shall make steady progress towa
the production of successful airships.

THE VALUE OF AIRSHIPS.

When we do get successful airships, there is no do
about the value which they will be to the World at lar
and to the British Empire in particular. There seems
be some kind of a law which decrees that the aeropla
shall be twice as fast as the airship. But, for World tra
except when aeroplanes are used over properly-organis
and properly-lighted air lines, such as Colonel Henders
laid down for the U.S. Post Office between San Francis
and New York five years and more ago, the airship c
go steadily plugging along through the night and so co
as big a distance in the 24 hours as the aeroplane whi
has only been able to fly during the day.

The time will undoubtedly come when we shall be
friendly enough terms with France to run high-speed
mail lines with aeroplanes, probably carrying passenge
across France to India and Australia. But before we ha
arrived at the stage of organised and properly lighted rou
as good as those in the United States, we shall probab
have produced airships which, without saying "By yo
leave" or "Thank you" to any nation, can make th
way across Europe on whichever course may be indicat
to them as most likely to give them a favouring wind,
accord with the Meteorological Department's latest int
view with the most recent depression by, with, or fro
Iceland.

Even in time of war, so long as our fighting aeroplan
hold the command of the air and can keep the airsh
routes free from enemy aircraft, the airships will do go
service as transport vehicles for senior officers and politi
personages who may be needed in one part of the Emp
or another.

Also, quite possibly, airships may be useful as actu
weapons of war. For offensive purposes they can car
quite a fair number of small fighting aircraft slung
neath their hulls, just as a couple of Gloster machines we
slung a year or so ago. And these fighting machines c
be released with their full supply of fuel on board to atta
enemy aircraft over their own country.

For defensive purposes, if ever we are so silly as to st
at home to defend ourselves instead of attacking o
enemy's countries, airships can do the job for which t
famous war-time Blimp was, in fact, evolved. The id
then was to attach an aeroplane to a small airsh
envelope, let it go aloft to hang in the air in comple
silence until it heard the enemy aircraft approaching, a
then slip it away from its gas-bag to attack.

A big airship could quite easily carry a full flight
intercepter fighters for the same purpose and slip the
against enemy formations when heard, or seen in t
beam of a search-light,—the fighters thus starting witho
the delay of the preliminary climb.

In fact, cutting out all the over-optimistic claims of ai
ship enthusiasts, and forgetting all the pictures we ha
seen of pretty ladies promenading on the saloon dec
of Lt.-Cdr. Burney's projected air liners, the airsh
is obviously a potentially useful vehicle. So whatever M
Neon may say or do, with or without a Spanner, we a
going to have airships.

Criticisms of the Neon and Spanner type have existe
since time began. Men of scientific attainments at lea
as high as Mr. Spanner's proved that no steam-ship cou
ever cross the Atlantic because it could not carry enoug
coal. And a ship did it just before the article was pu
lished. Designers of wooden ships proved to their enti
satisfaction that owing to their own weight iron shi
could not carry enough cargo to pay their way, and th
they would rust to such an extent that they would fa
to pieces in mid-ocean.

People who had been used to crossing streams by si
ting straddle-legged on a log must have said much th
same thing when someone hollowed out a log and sat insid
it. And the Naval architect who had been brought u
on log dug-outs certainly was as critical about the firs
man who made a boat by stretching skin over a wattl
frame.

Certainly the first man who ever tried to ride a hors
was ridiculed as a would-be suicide, and probably criticism
were equally severe about the first man who descended fron
his ancestral branches and tried to walk on his flat fee
on the ground. Every improvement in human transpor
has suffered from its Neons and Spanners, and critics o
that type have always been wrong. So why worry?.—C. G. G

London to Rome Non Stop and London to Singapore in 13 days

MR. BERT HINKLER is using a Fairey Metal Airscrew on his Avro "Avian" light aeroplane in which he is flying from England to Australia. The same airscrew was also used by him on his previous non-stop flight from London to Riga. Flights of this nature where both the highest possible cruising speed and the utmost reliability are essential, even under the varying climatic conditions encountered, emphasize the necessity for the use of this type of airscrew.

The R.A.F. Cairo–Capetown–Cairo operations, the winning of the King's Cup Air Race and the Schneider Trophy were a few of the important events achieved during 1927 by aircraft fitted with the Fairey Metal Airscrew.

FAIREY METAL AIRSCREW

(REED LICENCE)

The Fairey Aviation Company Limited of Hayes, Middlesex, are the sole licencees and manufacturers of the Reed patent metal airscrews for the British Empire.

THAT FIRST FLYING MACHINE.

The following letter has been received from one of the pioneers of British Aviation, who owned a monoplane and flew at Brooklands in the pre-historic days :—

Sir,—I should be greatly obliged if you would find space in your valuable paper for the following letter re Mr. Grey's article on the Wright Biplane.

After reading Mr. Grey's qualifications on page 160 of THE AEROPLANE of Feb. 8 entitled "A Critic's Explanation" I feel some diffidence in disagreeing with him on any subject, from Automatic Tools to Advertisement Canvassing. My only excuse is that I think he should have been a little more certain of his facts before writing such an article as "The Original Wright Biplane."

It must of course be very satisfactory for the Smithsonian Institution of Washington to be in complete agreement with Mr. Grey; and still more so for Mr. Orville Wright to know that these two authorities on Aviation "Admit that the Wright Biplane of 1906 was the first machine which ever flew." At the same time even experts are not always correct in their facts, and I think, if Mr. Grey would read up the history of those Pioneers the Wright Brothers he will find that their first power-driven aeroplane was first flown, *not* in 1906, but in 1903.

I am a mere layman and no aeronautical expert, nor do I hold any of Mr. Grey's many qualifications, so I am certain that he will have a very good answer to my letter. It would be interesting to know if Mr. Grey ever flew as passenger in one of these "death-trap" "contraptions," and the name of the pilot with "tight-rope" "qualifications," also from what circus the latter came.

Perhaps Mr. Grey could spare time to give us the following information :—Who was

(1) The first pilot to take a passenger;
(2) The first pilot to train a pupil;
(3) The machine on which this was accomplished.

Many years ago I flew on several occasions on a Wright Biplane with two different pilots. In my ignorance I enjoyed these flights, but I now know what risk I ran. However, in those early days one had not had the advantages of reading Mr. Grey's letter. "Fools step in where experts fear to tread."

(*Signed*) J. H. SPOTTISWOODE.

In reply to Mr. Spottiswoode's first point, one need merely state that the date 1906 was an error in transcription. The year in which both the Wright and the Langley machines were first tested was 1903.—Being, unfortunately, still in hospital one was unable to edit the article before it went to press. One may add that the Langley machine, strengthened but not altered, was flown by Mr. Glenn Curtiss on June 2, 1914.

As to the second point,—one has never flown in a Wright machine. Even in 1908, when one first had to do with flying, one knew better than that. One's first experience in the air was when one helped Capt. Bertram Dickson to crash a perfectly good Farman at Lanark in 1910. That machine had no pretentions to stability, but it had adequate controls.

One did *not* state that anybody from a circus ever flew any Wright machine. One said that to fly a Wright a pilot needed to have, by nature, the qualities of a tight-rope walker,—as was proved by the small number of pilots who were ever able to fly Wright biplanes of the original type.

When in 1910 the Wrights dropped the type with front elevators and without a tail, and took to the tail-behind type, their machines ceased to be Wrights and became just like those of any other maker in their essential aerodynamic design, so anybody was able to fly them,—subject to their liability to break in the air owing to flimsy construction.

As to Mr. Spottiswoode's three other questions,—one believes that Mr. Orville Wright was the first to take up a passenger and one imagines that Mr. Wilbur Wright, being the stronger character, was probably the first to train a pupil. Certainly both were done on a Wright machine. But that proves nothing beyond the truth of the old aphorism,—"To have *been* first merely proves antiquity. To have *become* first proves merit."

By 1910 the Wright aeroplane, as designed by the Wright Bros., was already a back number. But for many years the holders of the Wright patents endeavoured to block the progress of aviation by claiming that their patent for inter-connected rudder and wing control covered the case of a man operating ailerons with his hands and the rudder with his feet,—the man himself being claimed as the mechanical connection shown in their patent. And the consequent litigation did incalculable harm to the development of aircraft before the War 1914-18, both in Europe and America.

Beyond the fact that Mr. Orville Wright had the good luck to get it off the ground before anybody else—at a time when a number of other people, including Hiram Maxim and Horatio Philipps with captive aeroplanes, had already demonstrated that such a thing was possible—the Wright biplane has no claim to attention. Nobody ever owed anything to its design or construction, in the way that the designs of Curtiss, Voisin, Farman, Blériot and Levavasseur contributed to the World's progress. It is merely an interesting relic.—C. G. G.

BRITISH GUIANA REVOKES.

The formation of an air transport company in Br
Guiana, to which reference was made some time ago,
unfortunately, fallen through owing to lack of local inte
The required capital was not forthcoming and so those
were organising this scheme have dropped it. The
of the company was to have been the Fairey IIID an
equipment, human and material, which Mr. Hodgkin
the Real Daylight Balata Co., imported with the ide
running an ambulance service up-river to the diamond f

Apparently the people who run the diamond fields d
think that quick medical attention is of such importan
to justify the expense of keeping an aeroplane. So
Hodgkins' sporting effort has, after all, been wasted, th
presumably the demonstrations which the machine has
during the past few years of the benefits of air transport
ultimately have effect, even on the atrophied brains of
men who have lived too long in the Tropics.

The last piece of work done by the machine was in Se
ber, 1927, when Col. Bradburn, the Inspector-Genera
Police, travelled in it up to the Venezuelan Border t
operate with one of the Forestry officers in the N.W. di
of British Guiana in the search for Paul Redfern, the A
can aviator, who was lost in what was intended to be a
stop flight from Florida to somewhere in South Am
This search was without result.

The latest news is that the Fairey IIID has been pa
up for despatch to England. Mr. G. N. Trace hase al
started for this country and Mr. C. B. Baker intends to
back with the machine.

THE HANDLEY PAGE SLOT IN THE U.

Following on the announcement that the Handley
automatic slot patents had been acquired by the U.S.
it is now announced that the automatic slot will be
to all U.S. Naval aircraft in future.

The following companies are, at the moment, each
ing one experimental aircraft fitted with the automatic
the Curtiss Aeroplane and Motor Co.; the Boeing Air
Co.; the Loening Aeronautical Engineering Corpn.;
Chance Vought Corpn.; the Douglas Co.; the Glenn L. M
Co. and the Consolidated Aircraft Co. These seven
craft representing every type used by the U.S. Navy—
ing, patrol, pursuit, observation, scouting, and bomb
will be submitted to comprehensive tests before all pr
tion orders are fitted with the device. The slots on
machines will be set to act at an angle of 10 degrees
the case of pursuit aircraft, where aerobatics is esse
arrangements will be made for locking the slot.

It is stated that after paying royalties to the exte
$1,000,000 (£200,000) the United States will be free to
facture and use the device without further charge.

PROGRESS OF AIR SURVEY IN IND

The Survey Department of India has always given
support and encouragement to Air Survey undertak
and in consequence considerable progress has been
Results have been obtained in many classes of work
have proved clearly that both time and money can be
by the employment of air photography, if its limitation
its correct relation with the ground surveyor's work
fully understood.

The first Air Survey in India was that of 1,400 s
miles of the Irrawaddy Delta, which was made by Mr.
Kemp in the season of 1923-24.

Since that date numerous other large contracts have
completed by the Air Survey Company Ltd., of which
Kemp is the Managing Director, and Colonel C. H. D. R
C.B., C.I.E., D.S.O. (ex-Surveyor-General of India) i
Chairman.

It is interesting to note that this Company has bee
sponsible for all the commercial air surveys which have
carried out in India and throughout the East and that
have been continuously engaged on this work since 19

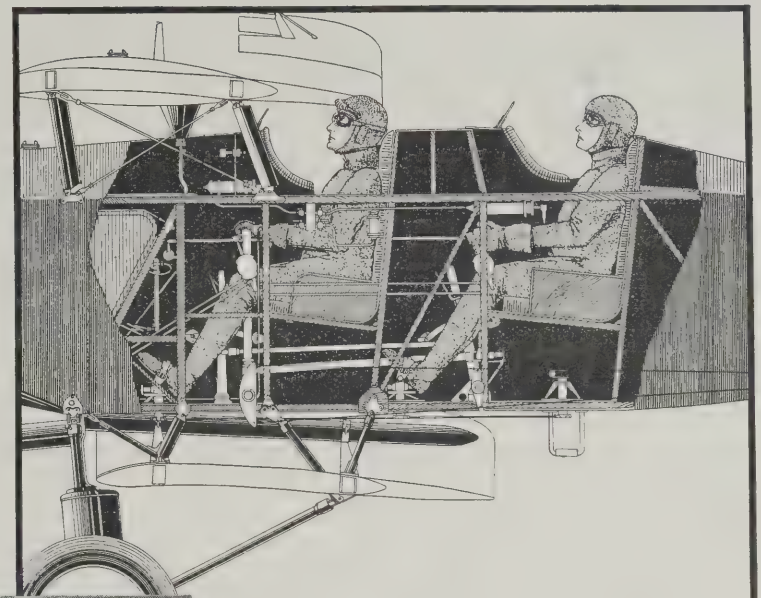
Up to the present time the work has been confined fo
most part to thickly-wooded or swamp districts wher
difficulties confronting the ground surveyor are enor
and the wealth of detail on the photograph affords
assistance to the Forest Officers in the compilation of
maps.

In the early part of 1927 when a field party of the
Survey Company were engaged on work in the Chitta
District of Bengal, an experiment was made with a vie
ascertaining how far the requirements of settlement
ping could be fulfilled. A test area was photographed,
it was found that satisfactory maps to the scale of 16 i
to the mile could be compiled from these.

"Bristol"

ADVANCED TRAINING MACHINE

Type 89a.



The sectioned drawing above will serve to illustrate some of the points which combine to make the "Bristol" Advanced Training Machine, Type 89a, the finest aircraft of its time for its special purpose. Special attention may be drawn to:—

1. The exceptionally strong plywood fuselage which reduces maintenance costs to a minimum.
2. The effective oleo undercarriage with long stroke legs giving 7 inches travel on oil and 1¼ inches on springs for taxying.
3. The quickly adjustable rudder bars.
4. The simple system of full dual control.
5. The fool-proof system of fuel supply by which adequate fuel is assured by gravity during level flight and under all conditions with a pressure of 1.25 lbs./sq. inch.

This machine is used for the training of Reserve Officers of the Royal Air Force in two of the most important schools in this country.

THE BRISTOL AEROPLANE CO., LTD., FILTON, BRISTOL.

Telegrams:—"Aviation, Bristol."
Telephone:—3906 Bristol.
Flying School:—Filton Aerodrome.

As a result of this experiment a contract has been recently concluded between the Director of Land Records and Survey, Bengal, and the Air Survey Company Ltd., for the survey and mapping on this scale of the entire Malda district which has an area of 1,600 square miles.

To obtain the high degree of accuracy which is essential for this class of work the latest developments of the radial method of plotting will be employed in conjunction with a close network of control points.

The country consists for the most part of paddy fields and the boundaries of these can be clearly seen on the photographs.

Approximately 1,680 control points are being established by the ground party, and as often as possible they will be located at the junction of the aisles of the fields.

They will be marked by digging four trenches two feet six inches wide by ten feet in length in the form of a cross, the earth being banked up on the East and South sides to ensure that a shadow will be thrown over them during the morning hours when most of the flying operations take place.

It is expected that in subsequent work of this nature such a close network of control will not be necessary but in easily accessible country it is sometimes justified by reason of the less complicated and quicker methods that may be employed in plotting map details from the photographs.

The Company's field party will be based on Mathrapur where an excellent aerodrome has been prepared by the removal of a few trees.

Temporary buildings have been erected for the accommodation of the D.H.9 aircraft and for the field darkroom work. The latest type of Eagle Air Camera will be used, while the main darkrooms and mapping offices will be equipped with the new Williamson Enlarger and Rectifier.

On Jan. 18 the survey party left Calcutta for Mathrapur and it is expected that it will be away for a period of approximately two months.

The importance of this work can be scarcely exaggerated, and it is likely to have far-reaching effects on the future of air surveys in the East, and in fact throughout the world.

The Air Survey Company Ltd. are already negotiating for similar work over much larger areas, and this, with their well-established business in lower scale surveys, is likely to provide them with work for many years.

On Jan. 11, 1928, a D.H.9 belonging to the Air Survey Co. Ltd. left Calcutta to make an aerial survey of the Orissa coast.

The primary object of the survey was to assist the Flood Committee to locate the cause and find a remedy for the incessant floods on the coastal plains of Orissa.

The survey party consisted of Mr. J. Durward, Mr. C. R. Thorne, photographer, Mr. S. H. G. Trower, pilot, Mr. R. W. Andrews and Mr. E. W. Bishop.

On arrival at Cuttack on Jan. 11, the survey was begun and in five days an area of 300 sq. miles along the Orissa coast from Chilka Lake to the Dhemra River was photographed. Maps are being prepared to a scale of 3 inches to the mile and the Committee is being supplied with both photographic maps and true topographical maps prepared from the photographs.

The photographs have clearly revealed the mass of banks lying outside the mouths of the main rivers which cause considerable obstruction to the flow of water from the inland plains during the rainy season.

The survey party returned to Calcutta on Jan. 17 after an absence of only six days, one of which was devoted to changing an airscrew on the D.H.9.

AIR SURVEY IN RHODESIA.

The work of survey undertaken for the Rhodesian Congo Border Concessions in Northern Rhodesia by the African Expedition of the Aircraft Operating Company, under Major Cochran-Patrick and Major H. A. Logan, has now been completed in so far as the work in the air is concerned.

An area of 1,000 square miles has been photographically surveyed, mosaic maps prepared, and photographs are already in use by the ground survey staff of the Rhodesian Congo Border Concessions, although it is too early to estimate the geological value of the survey.

In addition to this work a considerable amount of work has been done on behalf of the Northern Rhodesia Government. A Boundary Commission is at present at work in that country in connection with the boundary between that territory and the Congo, and a good deal of work has been done in the air in connection with this. The townships of Lusaka, Livingstone, and Broken Hill have also been photographed and aerial maps will be produced.

In connection with the survey of the upper reaches of the Zambesi, for the Northern Rhodesia Government, Major Cochran-Patrick has established his headquarters at Livingstone. The extent of the navigability of the river, the e location of the central channel, and the situation of s banks and rapids are the chief points. A photographer Major Hindley is operating at Mongu, and an astronom surveyor is working along the upper reaches near the P guese West African boundary. Altogether about 700 m of the river will be surveyed, and the aeroplane has b converted into a seaplane for the purpose. This mach however, will shortly proceed to Bulawayo, as during season of low clouds and rain the waters of the Zam rise to a level at which useful air work is impossible.

During this period of enforced inactivity in the air M Cochran-Patrick will return to Europe, as it is understoo is to undertake a survey in 'Iraq. Major Logan and a st ten will carry on in the meantime with the ground wor

CIVIL AVIATION IN EAST AFRICA

According to *The Times,* Mr. F. Tymms, the Air Min Superintendent of the Cairo—Karachi Civil Air Ser stationed in Cairo, has arrived in Kenya on a six-months vestigation into the question of the development and control of civil aviation in East Africa.

A report from *The Times* correspondent at Nairobi, d Feb. 19, states that a conference, attended by Sir Edw Grigg (Governor of Kenya), Sir W. F. Gowers (Govern Uganda), Sir George Schuster (representing the admin tion of the Sudan), and Sir Alan Cobham, has been hel discuss the establishment of an East African air servic

The report states that the chief difficulty is that of fin but that a satisfactory basis of agreement for the overcom of this difficulty has, it is believed, been reached.

From these two reports it seems safe to assume that administrative authorities in the districts in question really interested in the establishment of air communicat and that there is a likelihood of action to this end in near future.

The Times' correspondent states that Sir Alan Cobham siders that the air route between Alexandria and Kenya c be opened within a year of the completion of negotiat between the operating concern and the official bodies cerned. The extension of this route from Kenya to the would take three years.

Sir Alan Cobham is reported to have suggested that route hitherto followed by flights on the Cape route sh be modified. The section Alexandria—Kisumu should flown by flying-boats. From Kisumu the route via Mwa Tabora, and Abercorn should be abandoned, for a m easterly route via Nakuru, Nairobi, Arusha, Iringa, Tukuyu. The precise route from Tukuyu to Bulawayo is indicated, pending consideration of the various interests volved in this neighbourhood.

In this connection it may be recalled that in all flig so far made to South Africa, the object has been mainly of reaching Cape Town, and not of making intermed communications. For a commercial service the devia eastward to Nairobi is an obviously desirable one, part larly as the more direct route seems, from all accounts cross some singularly unpleasant country.

OUR MR. HINKLER.

By the time these notes appear Mr. H. J. L. Hinkl commonly and affectionately known to all in Aviation Bert—ought to have reached Australia, his native coun which will, one hopes, be duly proud of him. Whether has done so or not, by his journey to Singapore and bey Mr. Hinkler has once more proved himself to be one of finest pilots in the world, a fact which many of us h known for years past.

In these days, when so many young people have c into Aviation, men who made great flights eight or years ago are apt to be regarded as back numbers. there are young officers in the R.A.F. with some reputa as pilots who were small boys at prep. schools when Hinkler first made his name in 1920 by flying in 9 35 mins. non-stop the 650 miles from London to Turin o Baby Avro with a 35 h.p. Green engine, and proved this flight was no fluke by flying from Sydney, N.S.W. his paternal home at Bundaberg, in Queensland, 800 m in 9 hrs. non-stop, on the same machine a year later.

Mr. Hinkler came over from Australia early in the 1914-18, at the earliest military age, and enlisted in R.N.A.S., and was awarded the D.S.M. for bringing d several enemy machines as an observer in a Sopwith strutter squadron in France. When the R.A.F. was for he became a pilot, and won a well-deserved commiss Towards the end of the War he flew in Italy, where, squadron being short of machines, he, owing to his s size and light weight, and his ability as an engine-tu was able, with a Sopwith Pup fitted with a 110 h.p. Rhône engine, to keep station with the 130 h.p. Cler engined Camels of the rest.

ROLLS-ROYCE

THE BEST IN THE WORLD

SOME HISTORIC ACHIEVEMENTS IN RELIABILITY

ROLLS-ROYCE AERO ENGINES in a Handley-Page aeroplane flew from **ENGLAND** *to* **INDIA** *in* 1919.

ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew across the **NORTH ATLANTIC** *in* 1919.

ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew from **ENGLAND** *to* **AUSTRALIA** *in* 1919.

ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew from **ENGLAND** *to* **SOUTH AFRICA** *in* 1920.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew across the **SOUTH ATLANTIC** *in* 1922.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew **round AUSTRALIA** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Fokker monoplane flew from **HOLLAND** *to the* **EAST INDIES** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Handley-Page aeroplane flew from **BRUSSELS** *to the* **BELGIAN CONGO** *in* 1925.

ROLLS-ROYCE AERO ENGINES in Dornier-Wal flying boats flew from **MOROCCO** *to* **SPANISH WEST AFRICA** *in* 1926.

ROLLS-ROYCE LIMITED
14/15 CONDUIT STREET, LONDON, W.1
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Telephone: Mayfair 6040 (4 lines)

Practically ever since the War he has been an Avro pilot, and has tested from its first flight everything the firm has made, from the smallest to the biggest, even including such freaks as the Autogiro. And he has been equally at home on all of them.

As a cross-country pilot he has no superior. Mr. John Lord tells of flying to Martlesham with him over heavy clouds. They were due at a certain hour, and they saw no land all the way. At the hour Mr. Hinkler stuffed the machine down through the clouds—and came out on the Heath. With equal ease of mind Mr. Hinkler set off to Riga, 1,200 miles non-stop, in an Avian—as he said, to avoid the risk of being lost at Continental railway junctions.

His attempt on the long-distance record, with Mr. MacIntosh, was a failure, but the pluck and endurance both pilots showed made it one of the finest flights of the year.

Apart from the enhancement of Mr. Hinkler's reputation, and of the reputations of the Avro Avian and the Cirrus engine, this flight to the Far East should teach a valuable lesson to the British Empire, for it proves how easily we could run an air-mail line to India, Singapore and Australia.

People are so accustomed to think of air-lines in terms of great, slow, lumbering multiple-engined aerial omnibuses that they quite miss the idea of what an air-mail line should be. If little Mr. Hinkler in his little Avian with his little Cirrus engine can do his anything between 800 and 1,000 miles a day, how easy it would be, with relays of pilots and fast small machines, doing at most 300-mile stages, to average 1,200 miles a day.

If within the next five years we are not running mails to Australia inside 14 days for the full journey, then something has gone wrong with the enterprise of even the thick-headed Englishman. But at any rate, none can say that our Mr. Hinkler did not show the way to do it.

C. G. G.

MR. HINKLER'S PROGRESS.

On Feb. 14 Mr. Hinkler, who is attempting a high-speed flight to Australia on his Avro Avian (A.D.C. Cirrus engine), left Jask at 02.30 hrs. and reached Karachi at 15.30 hrs. The journey down the Persian Gulf was uneventful, except for a slight leak in the oil tank, which was repaired at the R.A.F. Depot.

On Feb. 15 he flew from Karachi to Cawnpore.

On Feb. 16 he left Cawnpore at 07.00 hrs. and landed on the Dum-dum aerodrome, Calcutta, at 13.30 hours.

On Feb. 17 he flew from Calcutta to Rangoon. After crossing the bay from Akyab he flew straight to Rangoon, crossing the Youras at a height of 7,500 ft. The flight took place between two storms, but although it rained heavily the journey was uneventful.

On Feb. 18 he flew from Rangoon to Victoria Point.

On Feb. 19 he left Victoria Point at dawn and flew through tropical rain to Singapore, a distance of 850 miles, where he arrived at 16.00 hrs. Just before reaching Si pore he was forced to make a *détour* of 50 miles to avoi thick storm-belt.

On Feb. 20, his fourteenth day after leaving Croydon, reached Bandoeng, Java, at 15.45 hrs.

On Feb. 21 he flew from Bandoeng to Bima.

On Feb. 20 A.D.C. Aircraft Ltd., the manufacturers of Cirrus engine, received the following telegram from W. N. Lancaster at Singapore :—

Hinkler requests me inform you Cirrus engine looks and ru though it had just come off test in spite of gruelling fl Lancaster.

SIR ALAN COBHAM'S PROGRESS.

A special contract for a double flight between Lake toria and Khartum, which Sir Alan Cobham agree undertake at the request of the East African Governm and the Colonial Office in order to complete the un taking of the Blackburn Company in connection with establishment of a permanent service, has been compl

From Entebbe to Khartum and back he covered miles in four days, the longest stage being the 820 m from Khartum to Mongalla, which he flew in 8 hrs. 40 m He has proceeded to Nairobi by air in Lord Carbery's 51, in order to discuss the financial aspects of the serv

THE ROYAL AERO CLUB.

On Feb. 15 a meeting of the Committee of the R Aero Club and the Management Committee of the Socie British Aircraft Constructors was held to consider the q tion of handicapping formula.

For the King's Cup it was decided that the handicap should not be on formula but on known performances.

It was decided to hold the Aerial Derby this year o course round London. In addition to the pure speed an Aerial Derby Handicap on formula will be held at same time. The S.B.A.C. put forward a formula whic was agreed to submit to an independent authority for report.

MLLE. PAULE SOULIER.

Those people in all countries who are interested en in their profession to read regularly that most impor French journal, *L'Aéronautique*, will learn with deep re of the death of Mlle. Paule Soulier, who for seven years contributed to that paper the sketches which have illustr the construction of new aircraft.

Mlle. Soulier's work had a character entirely its o It combined with a firmness of line which seemed esse ally masculine a meticulous care for detail which was equ essentially feminine. But what was even more remark was the fact that a young woman should have such a k insight and a thorough understanding of things mechan

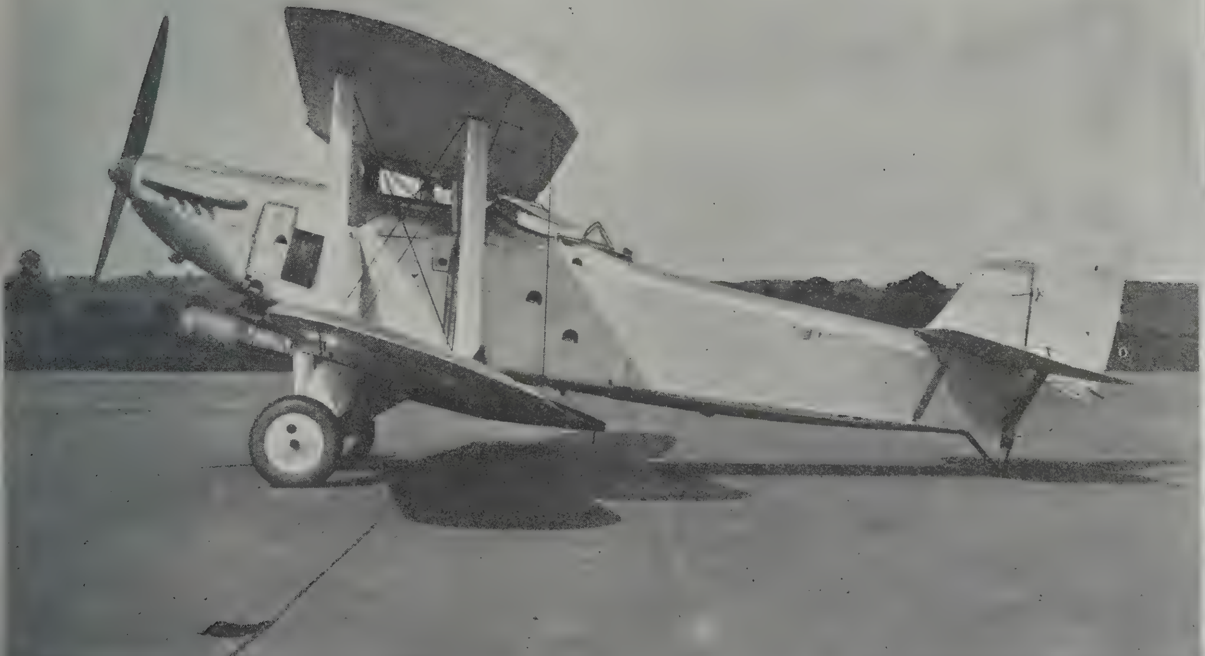
Mlle. Soulier was closely related to M. Henri Bouché, Director of *L'Aéronautique*. To him and to the staff of journal one offers sincere condolences.—C. G. G.

ANOTHER PRIVATE OWNER.—Miss Winifred Brown, the International lady hockey player and a member of the Lancashire Aero Club, taking delivery of an Avro Avian (A.D.C. Cirrus II engine) which she has purchased.

Blackburn
AIRCRAFT

THE DEFENCE of TERRITORIAL WATERS

The security of a Nation depends upon her ability to ward off invasion. The latest BLACKBURN Coastal Defence Torpedoplane- The RIPON II - for land or sea alighting, has been adopted by the British Air Ministry, & a number ordered for use in the Royal Air Force & Fleet Air Arm.



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B 36.

THE ROYAL AIR FORCE.

The London Gazette.

Feb. 14.

GENERAL DUTIES BRANCH.—The following Plt. Offs. are promoted to the rank of Flg. Off. :—N. R. Buckle (Aug. 8, 1927); R. H. C. Taylor Nov. 8, 1927); E. D. Turner (Nov. 8, 1927); E. L. Burslem (Nov. 10, 1927); J. R. Whitley (Jan. 17); C. R. McEvoy (Feb. 4). The following Plt. Offs. on probation are confirmed in rank :—G. J. Powell, T. H. Downes, J. F. Moir, L. T. Carruthers, R. S. Munday, D. L. Maclean (Sept. 1, 1927); J. D. F. Bruce, W. G. H. Ewing, R. J. P. Morris, H. A. G. Comerford, G. A. G. Johnston (Jan. 15).

The following are placed on the half-pay list, scale B :—Flt. Lt. F. L. Luxmoore, D.F.C. (Feb. 3); Flt. Lt. C. McL. Vincent, D.F.C. (Feb. 11 to 13 inclusive); Flg. Off. L. H. Anness (Feb. 9). Plt. Off. P. H. Jackson is placed on the retired list on account of ill-health (Feb. 15). The following are placed on the retired list at their own request :—Flt. Lt. N. M. S. Russell (Feb. 8); Flg. Off. L. R. Staddon (Feb. 13). Flg. Off. E. C. A. Wing is transferred to the Reserve, Class A (Feb. 4).

STORES BRANCH.—Sq. Ldr. J. S. Goggin is placed on the retired list (Feb. 14).

MEDICAL BRANCH.—The following Flt. Lts. are granted perm. comns. in the rank stated (Feb. 15) :—E. Thompson, N. I. Smith, M.D. The following are granted S.S. comns. in the rank of Flg. Off. for three years on the Active List, with effect from and with seniority of Feb. 2 :—J. Kemp, M.B., B. B. Kennedy, M.B., J. J. MacAndrews, M.B., R. F. MacLatchy, M.D., J. B. Murphy, M.B., J. C. Neely, B.A., F. A. O'Connor, M.B., L. O'Connor, M.B., J. J. Quinlan, M.B.

RESERVE OF AIR FORCE OFFICERS.—GENERAL DUTIES BRANCH.—Plt. Off. A. G. Store is promoted to the rank of Flg. Off. (Feb. 9). The following officers on probation are confirmed in rank :—Flg. Off. W. A. Ramsay (Feb. 13); Plt. Off. W. A. E. Featherstone (Feb. 9). The following are transferred from Class A to Class C :—Flt. Lt. A. W. Clemson, O.B.E., D.S.C. (Feb. 14); Flg. Off. M. R. Banks (Feb. 5). Flg. Off. R. E. Watson is transferred from Class AA to Class C (Feb. 11). The following relinquish their comns. on completion of service :—Flt. Lt. B. P. B. Carter, D.F.C. (Dec. 23, 1927); Flg. Off. A. H. P. Pehrson (Jan. 20); Flg. Off. W. R. K. Atkinson resigns his comn. (Nov. 16, 1927).

PRINCESS MARY'S R.A.F. NURSING SERVICE.—Sister Miss C. E. Holden resigns her appointment (Oct. 1, 1927).

Appointments.

Week ending Feb. 21.

GENERAL DUTIES BRANCH.—Group Captain C. T. Maclean, D.S.O., M.C., to Heliopolis Details, pending taking over command, 27/1.

Wing Commander R. E. C. Peirse, D.S.O., A.F.C., to H.Q., Middle East, for Air Staff duties, 3/2.

Flight Lieutenants W. E. Swann, to No. 25 Sqdn., Hawkinge, 21/1. H. C. Pyper, to R.A.F. Cadet College, Cranwell, instead of to H.Q., Cranwell, 10/1. J. V. Kelly, to H.Q., Middle East, 30/1.

Flying Officers W. L. Robertson, to No. 8 Sqdn., Middle East, 14/1. C. P. Ashton-Jinks, to No. 5 Sqdn., India, 31/1. L. C. L. Murray, to No. 20 Sqdn., India, 31/1.

MEDICAL BRANCH.—Flight Lieutenant J. D. Leahy, M.C., M.B., B.A., to R.A.F. Station, North Weald, 15/2. Flight Lieutenants (Dental) (Hon. Sq. Ldr.) E. A. Wheeler, to H.Q., Halton, 11/2. A. B. H. Cole, to M.A.E.E., Felixstowe, 14/2.

Flying Officers J. P. Hederman, to remain at School of Army Co-operation, Old Sarum. W. Heron, M.B., to Medical Training Depot, Halton, 1/2. J. F. McGovern, M.B., to Medical Training Depot, Halton, 1/2. Flying Officer (Dental) A. P. McClare, to R.A.F. Depot, Uxbridge, 18/2.

A Royal Investiture.

His Majesty the King held an Investiture at Buckingh Palace on Feb. 14. Among those in attendance upon Majesty was Air Marshal Sir John Salmond (Principal Aide-de-Camp). Among those present was Group Capt P. F. M. Fellowes (Aide-de-Camp in Waiting).

The following officers of the R.A.F. were introduced into presence of the Sovereign when the King invested them w the respective Divisions of the Orders into which they h been admitted :—*The Most Honourable Order of the B* (*Companion*). Air Commodore Hugh Dowding. *The M Excellent Order of the British Empire* (*Military Divisi Officer*), Wing Cdr. Edward Corballis.

His Majesty then conferred decorations as follows :— *to the Air Force Cross*, Flt. Lt. Sidney Webster. *The Force Cross*, Flt. Lt. Charles Carr and Flt. Lt. Robert Ra

The Far East Cruise.

The Service Cruise of the four Supermarine Southamp flying-boats (Napier Lion engines), under the command Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F. which left Cattewater on Oct. 17, arrived at Penang fr Mergui, Burma, on Feb. 16, having flown 500 miles in sev hours.

A *Reuter* message from Singapore dated Feb. 17 sta that 1,500 men have been employed during the last ei months in clearing the jungle for the new air base. A co crete slipway has been built, and work on the constructi of two sheds will begin as soon as the steel-work arrives

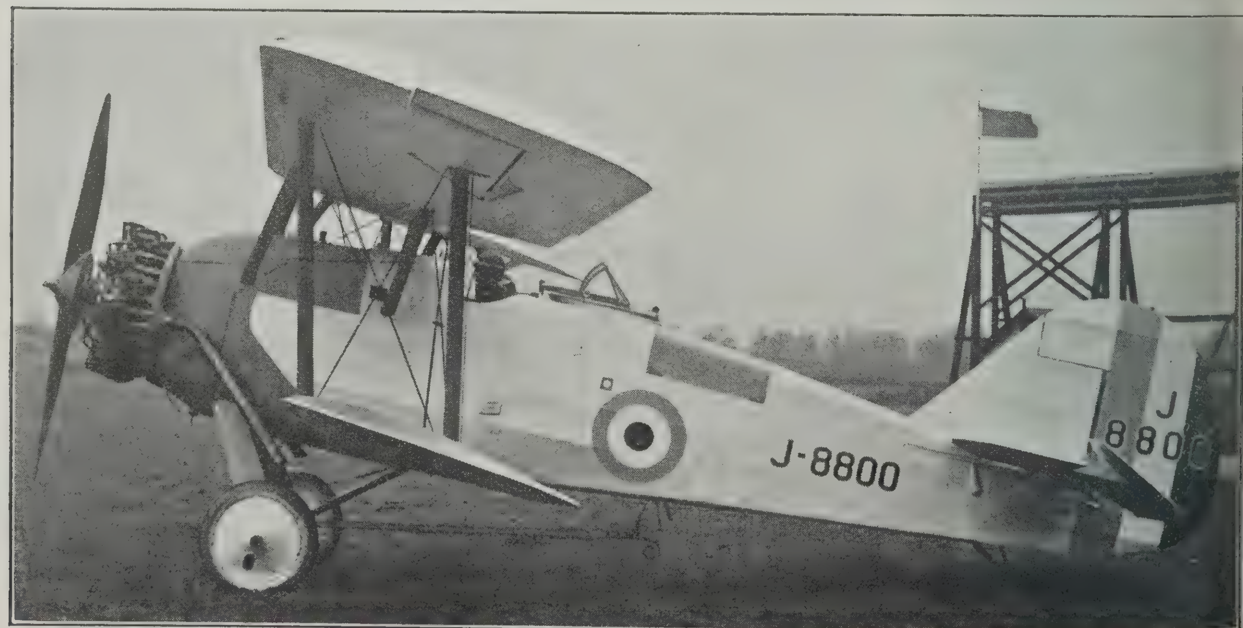
The Staff College, Camberley,

The undermentioned officer of the R.A.F. has passed sat factorily the course at the Staff College, Camberley, whi ended on Dec. 15, 1927, and is entitled to the letters q after his name in the Air Force List : Wing Cdr. W. T. Bo O.B.E., M.C., A.F.C.

The following officers of the R.A.F. have been appoint for one year to attend the course at the Staff Colleg Camberley :—Wing Cdr. A. T. Harris, O.B.E., A.F.C., a Sq. Ldr. C. G. Burge, O.B.E.

Group Captain C. T. Maclean.

Group Captain C. T. Maclean, D.S.O., M.C., whose appoi ment to Heliopolis Details pending taking over comma is dated Jan. 27, was born in 1886 at Greymouth, New Ze land, and educated at Waganui College and Auckland U versity. He was appointed to a commission in the N Zealand Forces in 1911 and granted a commission in the 7 Royal Fusiliers (Special Reserve) in August, 1914. He learn to fly on a Maurice Farman biplane at Montrose in 1915 a his Royal Aero Club Certificate No. 1899 is dated Oct. 1915. He was seconded to the Royal Flying Corps in Dece ber, 1915, and appointed Flight Commander in January, 19 Squadron Commander in September, 1916, and Wing Co mander and temp. Lieut.-Col. in August, 1917. He w awarded the Military Cross in February, 1915, and was a



LATEST EQUIPMENT.—The Armstrong-Whitworth Atlas (Armstrong-Siddeley Jaguar engine) which is the new Army Co-operation machine for the R.A.F.—(*"Aeroplane" photograph.*)

BY APPOINTMENT
TO HIS MAJESTY THE KING

On his wonderful Flight towards AUSTRALIA, Mr. Bert Hinkler is using

Wakefield Castrol

Flying his "Cirrus"-engined Avro "Avian," Mr. Hinkler left Croydon on February 7th, and in unbroken flight reached Rome the same evening, a distance of approximately 1,100 miles, covered in 13 hours 57 minutes.

This amazing flight breaks the existing Light Aeroplane distance and duration records, subject to homologation; and continuing his meteoric progress, Mr. Hinkler has travelled in daily stages to Malta, Ven Ghazi, Tobruk, Ramleh, Bazrah, Karachi, Cawnpore, Calcutta, Rangoon, Victoria Point and Singapore. At the time of going to press, the "Avian" is on the way to Batavia.

India was reached in seven days from England—still another record, and Calcutta, about 6,500 miles, in 9 days.

Naturally, Mr. Hinkler is taking no chances, and following the precedent set in so many great flights, he has insisted on—

WAKEFIELD

Castrol Regd.

MOTOR OIL

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pointed to be a Companion of the Distinguished Service Order in 1919. He was mentioned in Despatches (France) in February, 1915, September, 1918, and July, 1919.

After the Armistice he was appointed to the Air Ministry and later to H.Q. Inland Area for Personal Staff Duties. In September, 1922, he was appointed to H.Q. R.A.F. India for Air Staff Duties and on his return to Home Establishment in 1923 he was appointed to command No. 5 Flying Training School, Sealand. In November, 1925, he was posted to 'Iraq to command the station at Hinaidi.

Wing Commander R. E. C. Peirse.

Wing Cdr. R. E C. Peirse, D.S.O., A.F.C., *p.s.a.*, whose appointment to H.Q., Middle East, for Air Staff duties, is dated Feb 3, was born in 1892, the son of Admiral Sir Richard Peirse, K.C.B., K.B.E., C.B., M.V.O., R.N. (retired). He was educated at Monkton Combe School and King's College, London. He learned to fly on a Bristol biplane at Brooklands in 1913 while holding the rank of Sub-Lieut., R.N.V.R., and his Royal Aero Club Certificate No. 460 is dated Apr. 22, 1913. He was appointed Flying Officer, R.F.C. (Naval Wing), in October, 1913, and Flight Commander, R.N.A.S., in May, 1915. In a reference to the overseas work of the R.N.A.S. in the closing months of 1914, *The War in the Air*, Vol. 1, states :—" Flt. Lt. Peirse, in an old, inefficient machine which climbed badly, made many flights along the coast (Belgium), and was wounded by shrapnel in the air over Antwerp." He served in France from September, 1914, to August, 1916, and from March to June, 1918, and in Italy from June to November, 1918, and in the Adriatic from January to April, 1919. He was appointed a Companion of the Distinguished Service Order in April, 1915, for services rendered in the aerial attack on Dunkirk, on Jan. 23, 1915, and awarded an Air Force Cross in 1919 for distinguished services during the war.

After the Armistice he was appointed to Group H.Q., Dunfermline, and in 1922 he passed through the R.A.F. Staff College, Andover. In 1923 and 1924 he commanded the R.A.F. Base at Gosport and in 1925 was in the Department of the Deputy Director of Staff Duties at the Air Ministry in 1926. In 1927 he attended the first course at the Imperial Defence College.

Wing Commander Robert Leckie.

Wind Cdr. Robert Leckie, D.S.O., D.S.C., D.F.C., whose appointment to H.M.S. *Courageous*, pending commissioning was dated Aug. 26, 1927, was born in Scotland in 1890. He went to Canada at an early age and came back to England at the outbreak of War. He joined the R.N.A.S. as a Flight Sub-Lieutenant in 1915. He served with distinction at the Naval Air Stations at Great Yarmouth and Felixstowe and was concerned with two other officers in the destruction of two enemy airships over the North Sea. He was awarded the Distinguished Service Cross in June, 1917, appointed a Companion of the Distinguished Service Order in May, 1918, and awarded the Distinguished Flying Cross in September, 1918.

He was appointed to a permanent commission in the R.A.F. in August, 1919, with the rank of Squadron Leader and in December of the same year he was seconded to the Royal Canadian Air Force and attached to the Air Board of Canada. While in Canada he organised the first trans-Continental communication flight from the Atlantic to the Pacific. He himself piloted a seaplane as far as Winnepeg, whence the official messages were taken on by land-plane over the Rockies to Vancouver.

He returned to England in May, 1922, and was posted to the Staff of No. 1 School of Technical Training (Boys) at Halton. In September, 1922, he was appointed to the Royal Naval Staff College for a course. In July, 1923, he was posted to H.Q. Coastal Area and in March, 1926, he was appointed to command the R.A.F. Unit in H.M.S. *Hermes* on proceeding to the Far East.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of a collision in the air at Capel, near Folkestone, between two Grebe machines of No. 25 (Fighter) Squadron, Hawkinge, on Feb. 17, Plt. Off. Eric James Watson, the pilot of one of the aircraft was injured and died later of his injuries. The pilot of the other machine made a safe descent by parachute.

An inquest was held at Hawkinge on Feb. 20 on the body of Mr. Watson. Flt. Lt. G. H. Smith said that Plt. Off. Watson was accustomed to flying the Gloucester Grebe single-seater fighting machine which he was piloting at the time of the accident. The machine was in good order. He had examined the parachute after the accident. It was torn throughout the length of one seam. In making a parachute descent from an aircraft it was necessary to be quite clear of the aircraft before opening the parachute. It was possible this officer was not clear when he pulled his rip and parachute was caught in some part of the machine and torn. Ano possible solution was that Mr. Watson did not make use of parachute quickly enough. From 150 ft. to 200 ft. were required f parachute to operate and slow up the man. The machine did catch fire until after its impact with the ground.

Flg. Off. L. A. Walsh said :—" On Friday afternoon I told Off. Watson to do individual combat with me. I was his se We both went up and practised getting into position. He wa theory to try to hit. When we were just over 2,000 ft. up he atta me three times. After that he broke away, and I saw him a a mile away from me. To enable him to catch me up I throttled engine back to 1,000 revolutions and flew straight and level tow Dover. The next thing, I looked round and saw a pair of pl in vertical bank turning into me on the starboard side. Th felt the impact and my machine went out of control. My w were not damaged, but the tail of my plane was cut off. Wh realised the position I did my best to get out of the seat in machine. I succeeded. When I got out of the machine I cou eight and then pulled my rip cord. My parachute immediately op and acted well. Owing to strong north wind I was blown tow the sea. By 'spilling' air, however, I managed to come down some telegraph wires some 20 yards from the edge of the cliff on main Dover—Folkestone road. A civilian helped me down to road."

He thought, personally, that Plt. Off. Watson could not have him when he turned. In the course of these manœuvres the att ing officer could approach from any side he liked. The rule avoiding collisions was that the attacking man dropped behind.

The Coroner said that it was fairly clear that no one was to bl Mr. Watson had been engaged in an essential but hazardous occ tion.

The Jury returned a verdict of " Death by Misadventure."

The Air Ministry regrets to announce that a report has b received from 'Iraq that Flg. Off. Rolf Booth Hilton Jack the sole occupant of a D.H.9A machine of No. 55 Squad was killed on Feb. 20. It is at present believed that aircraft was shot down.

Air Action in the Sudan.

Air action by No 47 (Bombing) Squadron, R.A.F., statio at Khartum, took place during December last against disaffected tribes in the Lau Nuer country (Upper Province) south of Malakal. After every effort had b made by the District Commissioner to approach the tr by peaceful methods it was decided to drop light bombs the pyramid at Dengkurs and incendiary bombs on the villa of the tribes in that district.

An air reconnaissance was carried out on Dec. 13 and action began on Dec. 19. On Jan. 13 organised resista was at an end.

Flt. Lt. H. G. Rowe, R.A.F., was wounded during action.

Air Liaison in the Middle East.

According to the current issue of the Journal of the R *United Service Institution* three aircraft of No. 6 (Army operation) Squadron left Mosul on Nov. 12 on the first series of bi-monthly flights to Syria as a liaison with French Air Force. They visited Deir-es-Zor, Muslimiya Rayak and returned to Mosul on Nov. 20.

The Fleet Air Arm.

The Admiralty has decided to modify to a certain ex the periods during which Naval and Marine officers attac to the R.A.F. should serve as pilots in the Fleet Air A Naval officers are to be employed on flying duties for whole of their time as sub-lieutenant (where applicat lieutenant, and lieutenant-commander, subject to a minin of two years in general service as lieutenant or lieuten commander.

The old arrangement of dividing into periods from " A " to " with alternate air and general service, is abolished. It is inte that officers should not normally serve more than five years as p in one spell. Except in special circumstances, lieutenant-comman if not promoted to commanders, will revert to general service passing out of the promotion zone. Marine officers are to be ployed on flying duties till they attain five years' seniority as cap subject to not more than five years' continuous service as pilot out a period of corps duty.

The employment of both Naval and Marine officers is contingen their remaining fit and suitable for service in the Fleet Air and on their willingness to serve as pilots. Officers who do not d to remain in the F.A.A. will be permitted to revert to ge service on completing four years, but not before, except for sp reasons. Officers already attached are to report whether they to accept the revised conditions, or to remain under present condi and revert to general service on completion of their period " A

The Dunning Memorial Cup.

The Dunning Memorial Cup has been awarded to following officer who is considered by the Air Council have performed, during the year 1927, the most distinguis service in co-operation with the Navy :—Flt. Lt. Fred K

Flt. Lt. Kirk has been employed on Air Staff Duties Coastal Area Headquarters, R.A.F., since July 21, 1923.

SOME UNEQUALLED PERFORMANCES.

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LORRAINE AERO ENGINES.

Rome-Melbourne-Tokyo (54,000 km.) by Colonel de Pinedo and Campanelli (450 h.p. motor).
The Tour of Europe (7,500 km.) in 61 hours from start to finish, by Arrachart and Carol (450 h.p. motor).
Warsaw-Tokyo-Warsaw (20,250 km.) in 130 hours, by Lieut. Orlinski (450 h.p. motor).
Paris-Pekin (10,500 km.) in 6 days, by Pelletier Doisy and Carol (450 h.p. motor).
Circuit of the West Mediterranean (6,000 km.) in 41 hours 50 mins. from start to finish, by Pelletier Doisy and Gonin (450 h.p. motor).
Night Crossing of the South Atlantic, by Colonel Sarmento de Beires (450 h.p. geared motor).
Paris-Bombay-Belgrade (14,500 km.) in 89 hours flying time by Sondermayer and Baydak (450 h.p. motor).
Circuit of Eastern Europe (8,000 km.) in 7 days by Commandant Weiss and Assolant (450 h.p. geared motor).
Circuit of the Mediterranean (10,700 km.) in 6 days by Pelletier Doisy and Gonin (650 h.p. geared motor).
Michelin Cup, 1925 (Captain Pelletier Doisy), 1927 (Capt. Challes).
Breguet Cup, 1925 (Adjt. Sahuc), 1926 (Adjt. Duroyon).
King of Servia's Cup, 1926 and 1927.

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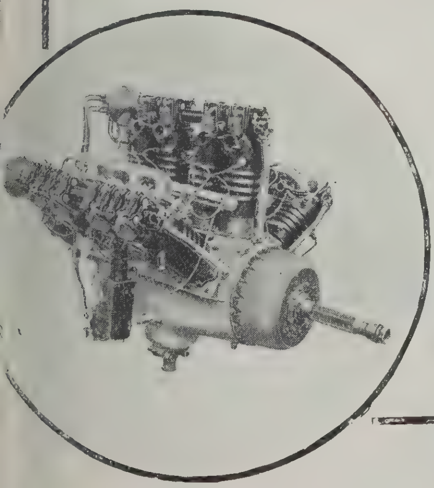

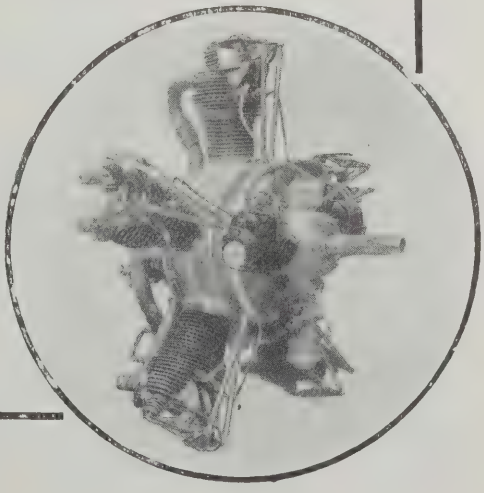

Relics and Recollections of No. 6 Squadron.

The Officer Commanding No. 6 (Army Co-operation) Squadron, now stationed at Mosul, 'Iraq, is anxious to get into touch with anyone who served with No. 6 Squadron, R.F.C. and R.A.F., during the War who would be willing to give or lend the Squadron prints of photographs of the Squadron during those days. In the case of loans every care will be taken to return the originals after they have been copied.

Personal reminiscences written by former members of the Squadron would also be greatly appreciated.

Any former member of the Squadron who would like to help in building up an historical record of the war-time work of the Squadron should write to Sq. Ldr. C. Hilton Keith, No. 6 (Army Co-operation) Squadron, R.A.F., Mosul, 'Iraq.

R.A.F. SPORTS AND PASTIMES.

The R.A.F. Rifle Association.

The annual prize meeting of the R.A.F. Rifle Association will be held at Bisley from June 3 to June 8.

The meeting will not be held in conjunction with the other Services this year.

The R.A.F. Rugby Cup Competition.

The third round of the R.A.F. Rugby Cup Competition has now been played with the following results:—*Northern Division,* Leuchars beat Shrewsbury 2—0.

Midland Division, Duxford beat Henlow 11—3. *South-Eastern Division,* Manston beat Andover 9—4. *South-Western Division,* Worthy Down beat Netheravon 9—6.

In the semi-finals, which have to be played before Mar. 10, Leuchars will meet Duxford and Manston will meet Worthy Down.

The final will be played at Uxbridge on Friday, Mar. 16.

Association Football.

AN R.A.F. OFFICERS' XI.—After the somewhat surprising result last season when the first R.A.F. Officers' XI defeated the Army Crusaders (the Army Officers' XI) at Aldershot by one goal to nothing, it was decided to increase the number of fixtures the following year, in the hopes that if sufficient enthusiasm was shown it might in time be possible to form an R.A.F. Officers' "Soccer" team on similar lines to the Army Crusaders, who have a complete fixture list.

Accordingly, invitations were sent to Units, asking that the names of Officers who could and would play if required might be submitted; no fewer than 31 names were forwarded.

Most of the unknowns were given trials in the R.A.F. Trial matches and a small fixture list arranged. Up to date the following matches have been played, all at Uxbridge:—*Versus* Lancing Old Boys, won, 3—1; London University, lost 2—6; Army Crusaders, won, 3—0; A.F.A. Public Schools XI, won, 3—2.

Not to be outdone, the Officers of the Royal Navy and Royal Marines formed a team, and played and defeated the Army Crusaders at Portsmouth by two goals to nil; to decide which Service had the best Officers' "Soccer" team a match has now been arranged between the Navy and Air Force Officers, to be played at Portsmouth on Feb. 22.

It is hoped next year to form an R.A.F. Officers' Associ
tion Football Club on the lines of the Army Crusaders ar
to embark on a fairly extensive fixture list.

The team picked against the Navy Officers is as follows :
Flt. Lt. G. A. Hadley (H.Q. Coastal Area, London), Flt. Lt. B. Anke
D.C.M. (South Farnborough), Flt. Lt. S. N. Webster, A.F.C. (Mart
sham Heath), Plt. Off. H. Downes (Manston), Flt. Lt. O. G. Gregs
(Lee-on-Solent), Flg. Off. W. F. Quilliam (Upavon), Flg. Off. R.
Whyte (Henlow), Flt. Lt. W. J. Millen (Netheravon), Flg. Off. R. P.
Pope, D.F.C. (Sealand), Flg. Off. V. Croome (Halton), Flg. Off. E.
Newman (Upavon).

Hockey.

Army versus Royal Air Force.—The Army beat the R.A.
at Colchester on Feb. 15 by nine goals to two.

The Times account of the game states :—

In the first few minutes of the game Roberts opened the scori
for The Army with a very clever reverse stroke, and a little lat
Salew scored the second point after some very pretty combined pl
with Roberts and Eagar. Now and again the Air Force threaten
danger, Perigo on one occasion just shooting wide from a good pa
by Stevenson. Before the interval the Army scored a third poi
through Fisher, the ball glancing off a defender's stick. In t
second half the Army started brilliantly, a beautiful run by Eag
and Roberts resulting in the latter adding a fourth goal. T
same player scored their fifth with a fine individual effort. T
Air Force then attacked strongly and Inglis opened their score w
a good shot. They were now playing much better, Vines putting
some brilliant efforts. Hampton also had very bad luck with t
shots. Towards the end the Army overran the Air Force defen
Eagar adding three goals in quick succession, and then from a brea
away Inglis scored the second goal for the Air Force with a fi
shot, from a penalty corner. Just before the finish a weak clearan
by Burd gave Lillie the opportunity to score the Army's last poin

The R.A.F. team were :—

Cpl. G. Butler (Stanmore), goal; Sq. Ldr. F. J. Murphy (Halton) a
Flt. Lt. J. M. Burd (Lee-on-Solent), backs; L-AC. T. Maher (Henlow
Flg. Off. R. M. Thomas (Bircham Newton), and L-AC. C. Crowth
(Uxbridge), half-backs; Flg. Off. C. P. Vines (Farnborough), L-A
Perigo (Bircham Newton), Flt. Lt. F. F. Inglis (Halton), Flt.
H. N. Hampton (Stanmore), and AA. C. Stevenson (Halton), forward

Cross Country.

The R.A.F. Cross-Country Championship will take pla
at Henlow on Mar. 21 at 14.45 hours.

The race will be divided into two classes (1) Junior, f
representatives of all Stations of a strength of under 500, an
(2) Senior, open to all Stations.

Entries should be sent, not later than Mar. 14, to the ho
Secretary, R.A.F. Athletic and Cross-Country Associatio
R.A.F. Depot, Uxbridge.

The W.R.A.F. Re-union Dinner.

The annual re-union dinner of the Womens' Royal A
Force will be held at the Victoria Mansions Restauran
Victoria Street, S.W.1, on Mar. 24.

The Guest of Honour will be Marshal of the Royal Air For
Sir Hugh Trenchard, G.C.B., D.S.O.

Application for tickets should be made to the Genera
Secretary, W.R.A.F., Old Comrades' Association, 5, Bucking
ham Gate, S.W.1, who would like to make it clear that th
dinner is for all ranks who served with the W.R.A.F. an
not only for members of the Old Comrades' Association.

SHOOTING IN EGYPT.—The Rif
Team of No. 4 Flying Trainin
School, Abu Sueir, won the Egy
and Sudan Rifle Trophy Compet
tion in January, 1928. This is th
first time the R.A.F. have been repr
sented in this competition, which
open to all Service teams and Civilia
rifle clubs in Egypt and the Suda
Twenty teams took part in the conte
which consists of deliberate shooting
200, 500 and 600 yards. No. 4 F.T.
scored 582, the 12th Lancers we
second with 578 and the Khartu
Rifle Club third with 573. No. 4 F.T.
have also won the first and secon
places and both individual champio
ships in the R.A.F. Middle East Con
mand Championships for rifle an
revolver.

The team are (left to right, stan
ing) : Plt. Off. G. R. Jackson, Cp
Press, Plt. Off. F. T. K. Bullmore, Cp
Smith. (Sitting) : S-M.1. Loughhea
Flt. Lt. R. S. Greenslade, Wing Cd
F. K. Haskins, D.S.C. (commandin
No. 4 F.T.S.), F-S. Salter and AC.
Laing.

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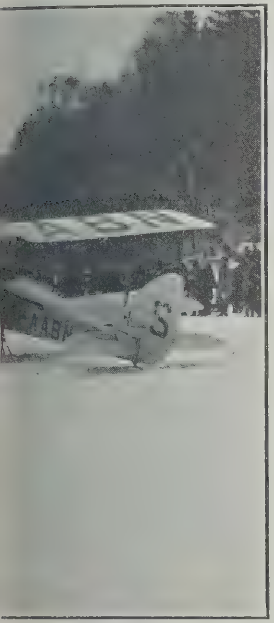

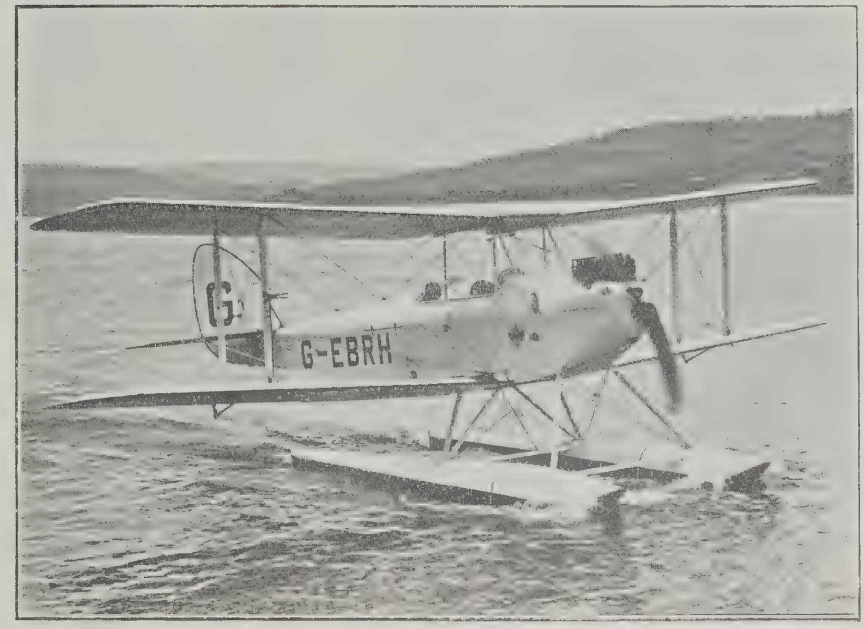

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CHEMICAL WARFARE FROM THE AIR.

In the course of a lecture on "Chemical Warfare" at the Royal United Service Institution on Feb. 8, Major Victor Lefebure, O.B.E., said that the combined use of aircraft and poison-gas constituted the most powerful argument for restricting chemical warfare. The conditions under which chemical warfare became most deadly and decisive were simple—a stationary, dense objective coupled with a sure method of applying adequate concentration of the lethal chemical. The absence of these conditions on the war front had removed, to a great extent, the decisive results which might have been expected from chemical warfare, but the combination of aircraft and poison-gas discharged on large towns brought the possibility of maximum efficiency.

A few simple figures would remove from this claim any charge of attempting sensational effect. Dr. Owens, of the Meteorological Office, had issued certain figures based on actual measurements showing the total weight of solid articles per volume of fog over the years 1926-27. These were in the region of one pound per million cubic yards, a concentration of about one part in a million by weight. This was higher than the effective concentration of gas war chemicals, particularly the new arsenic compounds. Assuming that such compounds dropped from aircraft would not dissipate into a layer more than 100 yards in height, a very fair assumption in large towns, it had been found that less than a quarter of a ton of chemical would be adequate to cover one square mile. If such a high factor as 100 was allowed to provide for the barriers which would prevent uniform concentration in the heart of a town, it would be seen the extreme ease with which a surprise aircraft attack, or a very large attack in which perhaps 90 per cent. of the aircraft were brought down, could induce chaos and terror.

The Lecturer went on to say that the sea presented the least profitable field for chemical warfare although direct hits with suitable gas projectiles might go very far in the direction of loss of ship control. A gas cloud would evade the system of compartments which proved so effective against shell splinters, and such a cloud would be drawn into every part of the vessel by virtue of the ventilation system. The best type of projector would be one which gave a sort of machine-gun effect.

Touching on the disarmament question the Lecturer said that his personal opinion was that limitation of armaments consistent with reason and stability was essential with regard to chemical warfare.

Opening the Debate, Major J. D. Pratt, Chief Superintendent of the Chemical Warfare Department, said that Major Lefebure's figures with regard to gas attack from the air might be misleading because such small quantities would only produce temporary incapacitation and even then there must be exposure for a certain amount of time. With people indoors the gas might roll down a street and cause no casualties. He thought that unless a sane judgment was developed the defensive methods might not receive serious attention.

In reply, Major Lefebure said that he had purposely given quantities of chemical in excess of that actually needed under ideal conditions.

General Sir Noel Birch, K.C.B., K.C.M.G., the Chairman, said that Professor Haldane in his book, *Callinicus, A Defence of Chemical Warfare,* had made gas warfare so pleasant that everyone who read it would want to go to war, but he did not think that any fighting man would agree with it. Other schools of thought made gas warfare a most horrible thing. Undoubtedly the lack of preparedness in chemical warfare in the past had cost a great number of lives. He concluded with a tribute to the great service of the Professors during the war which had put us on even terms with the enemy and had eventually enabled us to beat them.

THE COMBINED OPERATIONS IN THE BALTIC.

Commander A. W. S. Agar, V.C., D.S.O., R.N., gave a lecture on "Naval Operations in the Baltic" at the Royal United Service Institution on Feb. 15. Admiral Sir Sydney Fremantle, K.C.B., M.V.O., was in the Chair.

Commander Agar began his lecture by describing the collapse of Russia which resulted in the Treaty of Brest-Litovsk and said in the course of his remarks that the Duma was the only democratic Government that Russia had ever known. He went on to sketch the effect of the Versailles Treaty and its effects on the situation in the Baltic and the formation of the buffer States with the resulting political difficulties while these States were reorganised. He explained that Great Britain was the only one of the Allies which came forward when the States appealed for help and described how British Naval Forces were despatched in November, 1918. This was followed by Germany's advance into Latvia in March, 1919, an advance which was not held up until June, 1919. In the meantime the situation in the Baltic became more complicated by growing Bolshevik aggression b sea and by the fact that the whole of the Baltic had bee heavily mined by Germany and Russia during the previou four years and the mines had drifted over a vast area The necessity for British Naval reinforcements became acute and an advanced base was established at Biorko Soun Finland, to watch Kronstadt.

The Lecturer described the method of establishing an In telligence Service with Petrograd by means of 40-foot Coast Motor Boats manned by volunteers "disguised as Swede and commercial travellers." These motor-boats were towe to Revel by destroyers. At Revel they shipped torpedoes an joined up with the Forces at Biorko. They made three su cessful trips running through the forts at Kronsta and up river at night and getting into touch with th agents. The Lecturer referred casually to the destruction the torpedo from his own motor-boat, of a cruiser whic was bombarding one of the forts of the Allies.

The re-inforcements arrived in August and included H.M. *Vindictive,* carrying seaplanes and aeroplanes. Bases f the aircraft were established at Biorko and H.M.S. *Vindi tive* was used as a Depôt ship for the Coastal Motor Boat Preparations were made for an attack on Kronstadt and photograph was taken from the air which showed the exa dispositions of the Fleet in Kronstadt Harbour. The Lectur showed a slide of this photograph.

The attack on Kronstadt started with a bombing raid fro the air in order to attract attention from the boats while th got through the passage of the forts. The Lecturer d scribed the various objectives and illustrated his descripti with the aerial photograph and said that the aircraft c operations covered their entry through the chain of for and also covered their retirement according to plan. I added that as far as the aircraft were concerned everythi went according to plan and described what he considered be two fine instances of the aircraft co-operation. He sa that the searchlights from the forts had picked up one the boats and it was under heavy fire. One of the aircra flew down between the boat and the searchlight and direct the fire to itself. The other incident was that of a machi the engine of which cut out on the way to Kronstadt a the pilot had to return to his base. As he reached his ba the engine picked up a little and he returned to Kronsta and discharged his bombs. The engine then failed co pletely and the machine fell into the sea but the pilot w rescued.

Commander Agar summed up his lecture with the followi conclusions. The first was a need for a clear-cut policy home. The second was the value of offensive action a surprise. The third was the lesson of the value of c operation between sea and air action. He said that t operations in the Baltic and had been a complete example gallant and unselfish co-operation between the forces of t sea and the air.

In connection with Commander Agar's Lecture it is int esting to recall that in *The London Gazette* of July 12, 19 the following decorations were awarded for operations in t Baltic. Distinguished Flying Cross: Flt. Lts. C. Boumphre J. MacG. Fairweather and A. W. Fletcher. In the sa *Gazette* the names of eleven officers of the R.A.F. appear as having been mentioned in despatches in connection w the operations in the Baltic. Flt. Lt. D. G. Donald w awarded the D.F.C. in *The London Gazette* of Dec. 22, 19 for distinguished service during the war and since the cl of hostilities (Baltic).

Flt. Lt. (now Sq. Ldr.) D. G. Donald, D.F.C., A.F.C., w in command of the R.A.F. Units in the *Vindictive,* Flt. C. Boumphrey, D.F.C., was in command of the seaplan and Flt. Lt. J. MacG. Fairweather, D.F.C., was in comma of the aeroplanes.

U.S. AIR CORPS BOMBING PRACTICE.

During December, 1927, U.S. Air Corps units station at France Field, Canal Zone, were given the opportunity carrying out live-bomb practice on an old cargo vessel, t s.s. *Manari.* This vessel had been offered to the Co Artillery for destruction but owing to shortage of ammu tion they were unable to accept it.

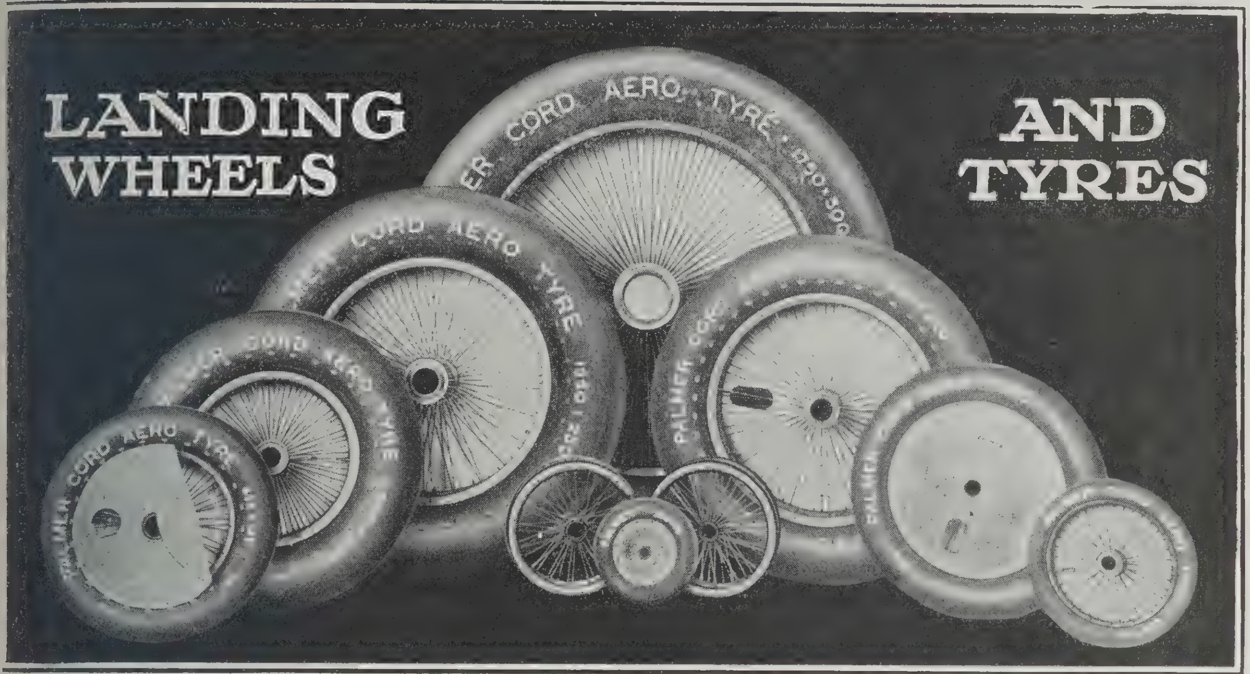
It was intended that the 24th Pursuit and 7th Observat Squadrons, using 25 lb. fragmentation bombs, should si late an attack upon personnel and machine-gun posts on ship after which the 25th Bombardment Squadron sho sink the ship with 100 lb. demolition bombs.

The *Manari* was towed out to sea by a mine-layer wh accommodated a number of Army official observers.

The 24th Pursuit Squadron delivered its attack and ship began to list and before the 7th Observation Squad could drop all its bombs it rolled over and sank in 45 fatho thus demonstrating the destructive effect of 25 lb. fragme tion bombs on an unarmoured ship.

Other means had to be devised to allow the Bombardm Squadron to dispose of its fused demolition bombs.

PALMER



STANDARD SIZES.

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
"	172	130.	38.09	Central
575×60	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
600×75	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
00×100	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
700×100	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
650×125	119	178.	55.	132/46
"	147	178.	55.	Central
"	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
"	162*	185.	55.	Central
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	177	185.	55.	135/50
"	183	185.	55.	Central
"	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
"	174	250.	80.	Central
"	182	185.	55.	Central
"	187	220.	66.67	Central
"	201	185.	60.32	125/60
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900×200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	157	185.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
975×225	192	185.	60.32	Central
"	194	185.	55.	125/60
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
"	191	350.	150.3	Central
1750×350	193	400.	125.	Central

heels Nos. 161. 162, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres. †*Wheel No. 169 is fitted with Ball Bearings.*
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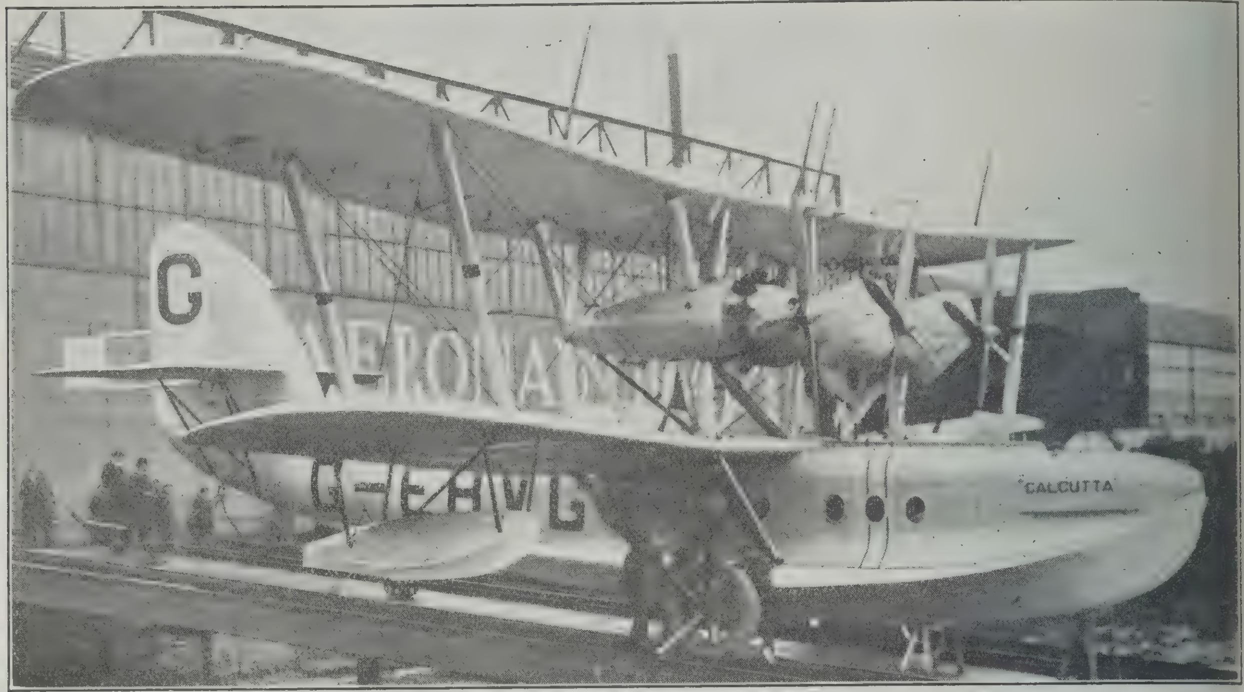
(365)

THE SHORT CALCUTTA.



THE SHORT CALCUTTA.—A fifteen passenger all-metal flying-boat fitted with three 485 h.p. Bristol Jupiter IX engines. —(*" Aeroplane " photograph.*)

The Short Calcutta flying-boat, launched last week, is the first large all-metal flying-boat designed specially for commercial passenger-carrying which has been built in this country. It is also the first of the recent all-metal machines built by Short Bros. to escape from the ban of secrecy, and therefore available for any detailed description.

A description of the Calcutta was published in THE AEROPLANE (Jan. 12, 1927) when the design alone existed. This original design has not changed noticeably, and the photographs of the machine reproduced show very clearly the layout of the machine. It will not therefore be necessary now to do more than to recapitulate the main characteristics.

The Calcutta is a three-engined tractor biplane flying-boat of normal type. The upper wing is of greater span than the lower.

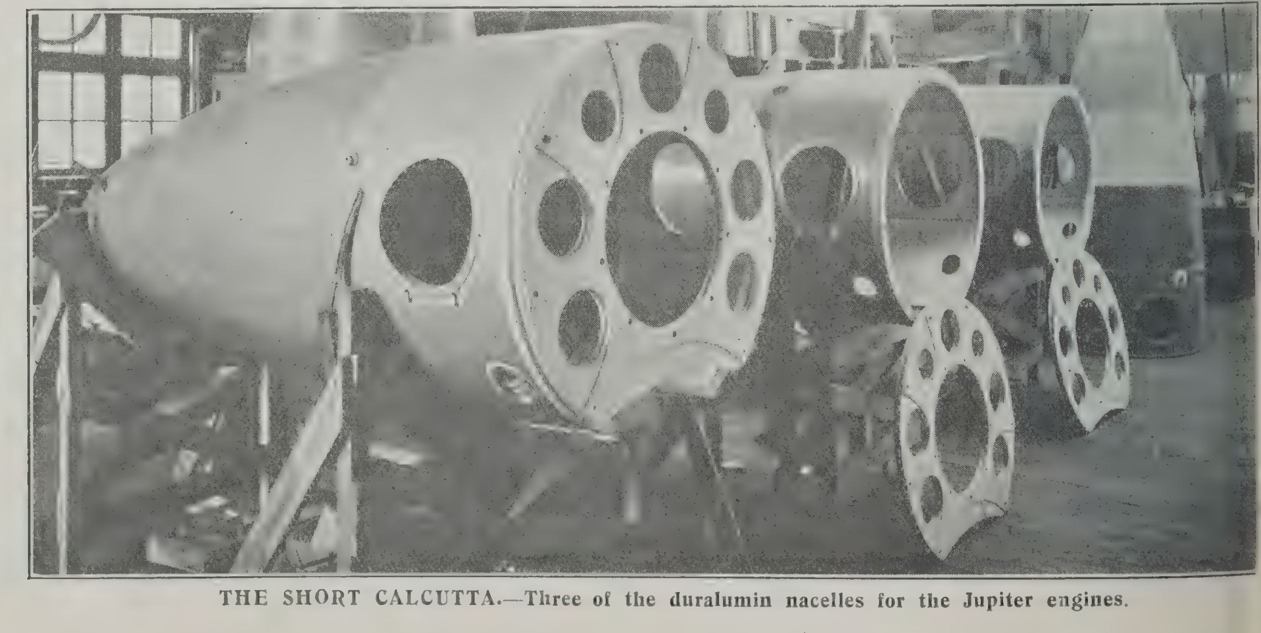
Top and bottom wings are made each in three sections—one wide centre section—which is carried on spars built into the hull in the case of the bottom centre-section, and two extensions. All three engines are mounted between top and bottom centre-sections, and the system of struts which support the engine nacelles also serve to support the top centre-section. Outside the centre-section there is only one pair of interplane struts on each side. These rake outwards and upwards to conform to the extended span of the top wing.

The hull has a concave-Vee bottom with two steps. Fo
ward the maximum beam of the hull is on the chine-lin
Above the chines the hull section is nearly a rectangle wi
rounded-off top corners, connected to the chine by a lar
radius on each side. Aft of the cabin the general secti
of the hull becomes oval.

The lines of the hull are the result of model experimen
made in Short Bros.' private tank at Rochester. They r
semble very closely those of the Short Singapore, but wi
minor modifications suggested by experience with that m
chine, which make for cleaner running, reduced shock
alighting, and lower air-resistance. One interesting featu
is that the aft-step of the Calcutta has been joined into t
body lines in a way which reduces air resistance very co
siderably and does not interfere with the effectiveness
the step on the water.

The horizontal tail plane is carried on a structure with
the fin framing and well above the hull. It is strut-brac
to the hull below. The divided elevators are horn-balance
as is the rudder.

In addition, the main rudder is fitted with a ser
rudder. This is essentially a small auxiliary rudder carri
from and behind the rudder proper. This auxiliary rudd
is so connected to the rudder control wires that a mo
ment of the rudder bar, which sets the main rudder ov
to one side, sets the auxiliary rudder over to the oppos



THE SHORT CALCUTTA.—Three of the duralumin nacelles for the Jupiter engines.

Carbon knows no Discipline

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side. The consequent air load on the auxiliary rudder therefore helps to turn the main rudder in the desired direction.

The Hull Structure.

The hull structure is of the same general type as that of the fuselage of the earliest of Short Bros.' all-metal aeroplanes, the Silver Streak. That is, the skin-plating itself is the main stress-carrying member. The skin is supported internally by a number of relatively light duralumin frames, and by a series of even lighter longitudinal members between frames. These longitudinal members do not run through the frames—they serve as local stiffeners of the skin and not as longitudinal beams.

In line with the bottom centre-section spars there are two very stiff transverse frames. The spars proper are built into these frames, and to them also are attached the lower-centre section strut-tubes.

One feature of this type of hull is that the whole of the skin plating—except that behind the frames and stiffeners—is accessible from inside. Even the interior of the steps can be reached and inspected, cleaned and, if necessary, mopped dry without any trouble—a feature of very great importance in regard to maintenance. Concealed crevices in which moisture may collect are places where corrosion will start, and where it will proceed most rapidly if thorough cleaning, drying, and protecting methods are not applied whenever needed. All steel fittings on the hull are of stainless steel.

At intervals along the hull vertical water-tight bulkheads are provided across the lower part of the frames. These do not extend the full depth of the hull, and therefore do not divide it into definitely separate compartments. But they are of such a height that their upper edges will remain above the water-line even if two of the sections between bulkheads are opened to the water outside. Therefore the incoming water from a leak will be confined to the leaking section of the hull.

The Hull Equipment.

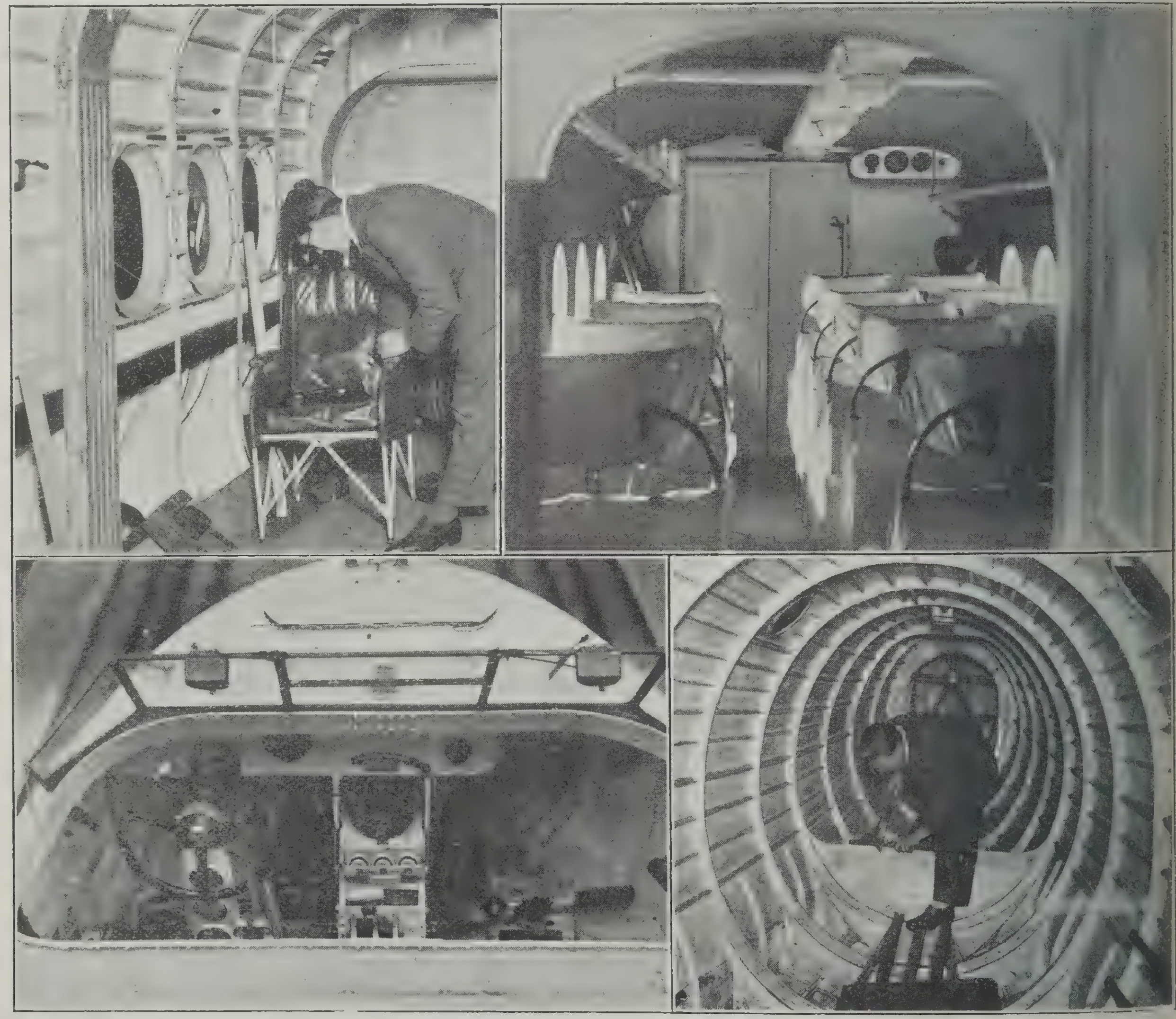
In the nose of the hull is the usual bow-cockpit used for mooring or unmooring the boat. This cockpit is closed by a hinged cover when it is not actually being used. Behind are two side-by-side seats, one for the pilot on the port side, and one—with easily removable control gears and a folding-seat—for an assistant pilot-mechanic to starboard. A photograph shows how roomy is this cockpit.

Behind this cockpit is a wireless cabinet. This communicates directly with the pilot's cockpit, and, when the starboard seat is folded and the second control detached there is a straight way through to the bows.

There is also a doorway through from the wireless room to the passenger saloon, which is immediately aft. This saloon is 17 ft. (5.18 m.) long, 6 ft. 6 in. (1.98 m.) wide, an has 6 ft. 3 in (1.90 m.) headroom. It is fitted with five rows of seats, one in each row to port, and two in each row t starboard of a through gangway. These seats are, like the rest of the Calcutta, metal-framed and are fitted wit cushions which can be detached and used as lifebelts in a emergency. There is a collapsible table for each seat.

There is one large glazed porthole on each side for eac row of seats, giving all passengers an excellent view outwards and downwards. Adequate electric lighting is provided for use at night.

At the back of the passenger space is a buffet fitted wit oil-cookers and an ice-chest, so that the steward in charg may dispense either hot or cold refreshments. No petro being carried in the hull or near it, and the hull being o metal, this cooking gear and, incidentally, smoking in th cabin, is safe.



THE SHORT CALCUTTA.—Some details of the hull. Top, left, part of the cabin interior, before the cabin lining was in place, showing one of the passenger seats with its life-buoy cushions. Top, right, is the cabin completely furnished. Bottom, left, a view of the pilot's cockpit, with the second pilot's control gear removed. The cover over the mooring hatch may be seen forward. Note the electric wind-screen wipers. At the right, bottom, is an interior view of the hull behind the cabin section. This shows clearly the type of hull structure used throughout.

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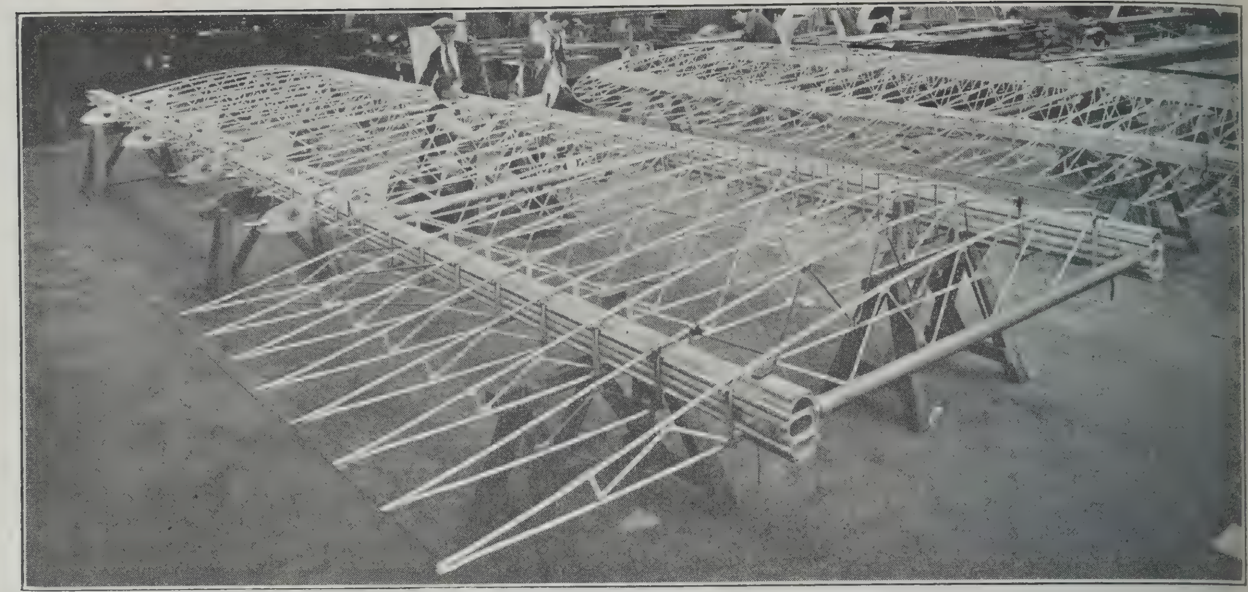


THE SHORT CALCUTTA.—A pair of all-metal wings in the works at Rochester.

Luggage is carried behind the passenger space. A hatchway right forward is provided for passengers, and another aft for luggage and goods.

WING CONSTRUCTION.

The wings are built on two box spars, each of corrugated duralumin. These boxes are formed by two top members which are convex outwards and two side members each of which have two complete corrugations in them. The four components of the box are rivetted together along flanges, which also serve for the attachment of the ribs.

The external dimensions and form of the spars is uniform over their whole length, but the thickness of wall varies—to meet the variations in stress—along this length. This variation is provided by varying the number of thicknesses of sheet used in the wall members.

The ribs are Warren girders of duralumin tube, hel together with very simple sheet duralumin clips, and t drag struts are duralumin tube.

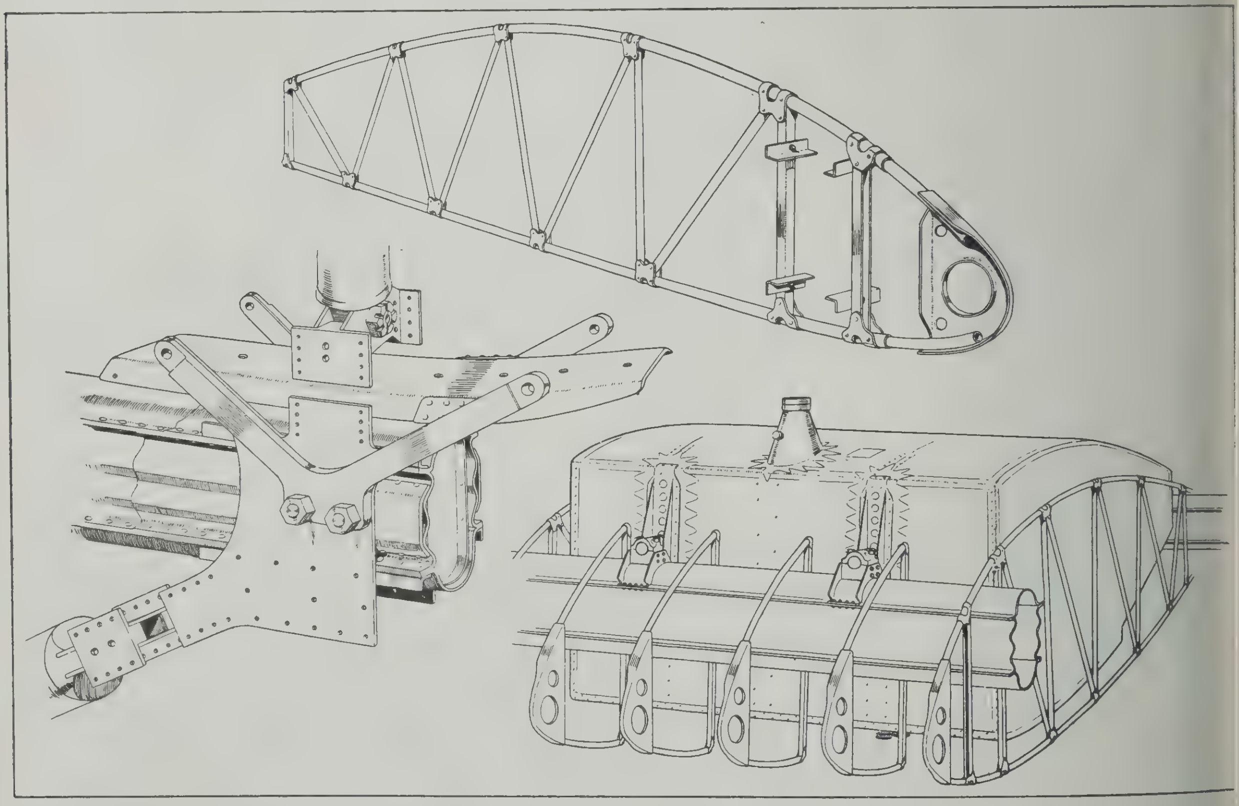
The fittings on the wing-spars for attaching interpla struts, bracing wires, and for the joints between centr section and extensions are all of stainless-steel, with stai less-steel bolts.

Petrol tanks—one above each engine—are of tinned ste sheet built into the centre section.

Tail-plane and fin are both built on duralumin box spa of a form similar to that used for the wing spars.

ENGINE MOUNTINGS.

The engines are carried in streamline nacelles, built the same principle as is the hull. That is to say that t skin is the stress-carrying member, and there are no lo



Calcutta Wing details. At the top is shown a rib. At the left, bottom, is shown the end of one of the bottom centre-section spars with the fittings which take the strut from centre section to hull, the interplane and engine struts and the bracing wires. The fish plate which serves to join the centre section spar to the wing extension spar is shown on the top only. There is actually another similar fish-plate on the bottom of the spar. All the plates and bolts for these fittings are of stainless steel. This sketch also shows the section of spars used throughout this machine. On the right is shown one petrol tank built into the upper centre section.

SHORT

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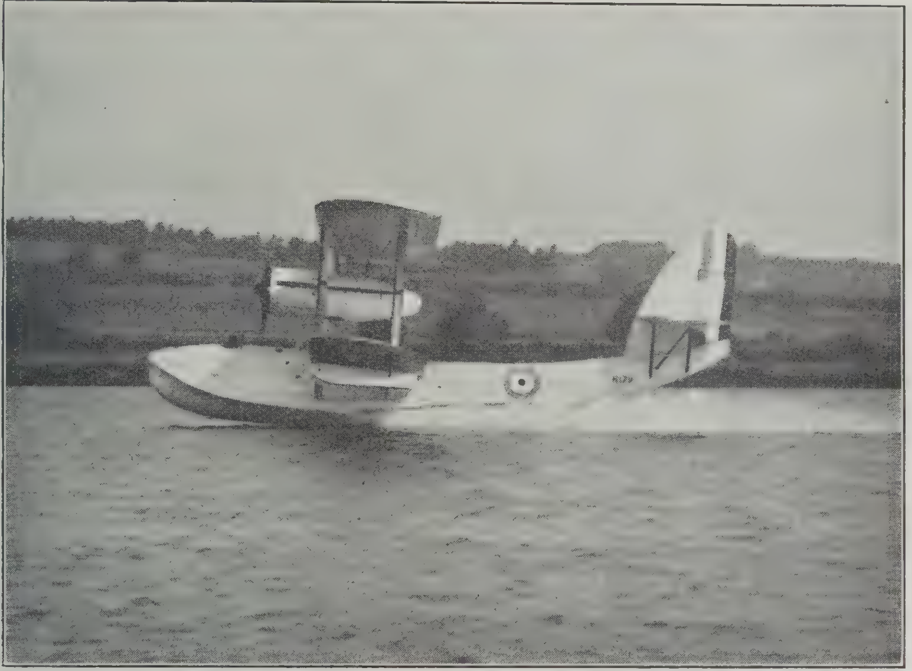

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gerons or similar heavy parts concealed within them. Oil tanks are carried in these nacelles, and external oil coolers are practically the only projections on these nacelles.

In the central nacelle there is also a Bristol starter engine, which can be used to start up all three engines, and in addition to drive a dynamo and a bilge pump. Usually, current for lighting and wireless is provided by a wind-driven generator, but this second dynamo may be used for either or both purposes when the machine is at rest on the water.

The Calcutta has an exceedingly complete wireless equipment. Working on the telephone its transmitting range is 200 to 250 miles. On telegraphy this range rises to 300-400 miles. An emergency aerial on the top plane permits wireless working when the boat is on the water. In addition, fore-and-aft loop aerials are fitted for wireless direction-finding.

A very much more graphic idea of the detailed design of the Calcutta can be obtained from the illustrations which are reproduced herewith than from any merely verbal description, so that it is not proposed here to go further into these details, but rather to let the illustrations speak for themselves.

THE GEARED JUPITER ENGINES

One point of special interest is the fact that the engines fitted to the Calcutta are of the new Bristol Jupiter Series IX. type. These engines closely resemble the famous Series VI. type, but they are fitted with reduction gears giving a 2 to 1 ratio. As a result the engines may be run up to high speeds of revolution without ill-effects on airscrew efficiency.

These engines develop a normal output of 485 h.p. at 2,000 r.p.m., instead of the 450 h.p. at 1,700 r.p.m. in the Series VI. type. The result of fitting geared engines is in the first place to give this marked increase in engine output, and secondly to allow the use of airscrews which convert a considerable larger proportion of that output into useful thrust.

The over-all effect is therefore much greater than would be indicated by the engine h.p. figures—certainly in this case twice as much.

SPECIFICATION.

DIMENSIONS.—Span, top, 93 ft. 0 in. (28.35 m.), bottom, 76 ft. 6 in. (23.15 m.), Length 64 ft. 9 in. (19.75 m.), Height 22 ft. 3 in. (6.8 m.), Wing area 1,825 sq. ft. (170 sq. m.), Horizontal tail area, including elevators, 217 sq. ft. (20.16 sq. m.), Vertical tail area (fin rudder and servo rudder) 113 sq. ft. (10.5 sq. m.).

WEIGHTS AND LOADINGS.—Weight empty 12,600 lbs. (9,185 kg.), Crew (3) and crew's bagage 768 lbs. (319 kg.), Wireless, electrical and navigational equipment 562 lbs. (255 kg.), Petrol (360 galls. = 1,640 litres) 2,430 lbs. (1,105 kg.), Oil (30 galls. = 136 litres) 300 lbs. (136 kg.), Pay load capacity 3,540 lbs. (1,610 kg.), Loaded weight 20,200 lbs. (9,185 kg.), Wing loading 11.05 lbs./sq. ft. (54 kg./sq. m.), Power loading at maximum h.p. (1,575 h.p.) 12.8 lbs./h.p. (5.83 kg./h.p.).

PERFORMANCE (estimated).—Max. speed 118-120 m.p.h. (190-193 km.h.), Landing speed 57.5 m.p.h. (93 km.h.), Climb at sea level 800 ft. (244 m.) per min., Service ceiling 10,000 ft. (3,050 m.), Range (320 galls. petrol) 500 miles (805 km.) in 5½ hours, with 480 galls. petrol (full tanks) and correspondingly reduced pay load (2,300 lbs.) 740 miles (1,190 km.) in 8¼ hours.

THE CURTISS SUPERCHARGED FIGHTER.

The Curtiss Aeroplane and Motor Co. has received an order from the U.S. Air Corps for a number of Curtiss P-5 single-seat pursuit aircraft fitted with the Curtiss D-12F engines and side-type exhaust-driven superchargers.

This machine, known as the Super-Hawk, is a development of the standard service Hawk. The side-type supercharger is installed near the nose. The usual type tunnel radiator is used but it is larger than the standard Ha radiator. In addition there is an auxiliary radiator mount forward of the supercharger.

The Curtiss D-12F engine, which is a modification of t standard engine, has a heavier crankshaft than is us normally and is fitted with the Splitdorf VA-1 magneto a a special carburettor air-scoop for use with superchar The engine feed-pump, which is normally mounted on crankcase, has been lowered and is driven by a flexi shaft.

Particular attention has been devoted to the furnishin the pilot's cockpit. A cockpit heater taking warm air around the exhaust manifolds is installed and in addit a cockpit "cape" is provided which covers most of cockpit opening. Two oxygen bottles are installed for r by the pilot at high altitudes.

The undercarriage is of the rigid type with special landi wheels having built-in oleo shock-observers and hydrau brakes.

No official performance figures are available but it is ported that the Super-Hawk has a speed of 185 m.p.h. 20,000 feet and has a service ceiling in the neighbourh of the present World's Height Record.

These machines will constitute the first supercharg fighter equipment to be placed in service in the U.S. Corps.

A CURTISS CABIN MONOPLANE.

The Curtiss Aeroplane and Motor Company, of Garden Ci L.I., N.Y., are designing and building a small three-s cabin monoplane, fitted with the 90 h.p. Curtiss OX-5 gine, to be known as the Robin.

This machine will be marketed by the Robertson Aircr Corporation of St. Louis, which latter company, some ti ago, bought up all available Curtiss OX-5 engines.

According to a reliable authority, after the Robertson co pany had cornered the market in Curtiss OX-5 engines prevailed on the Curtiss company to design and build machine suitable for it and then bought it outright with the drawings.

No particulars of the machine are available beyond fact that it is a cabin monoplane similar in appearance the Ryan with accommodation for the pilot in front and t passengers seated side-by-side behind.

LANDING AN AIRSHIP ON A SHIP.

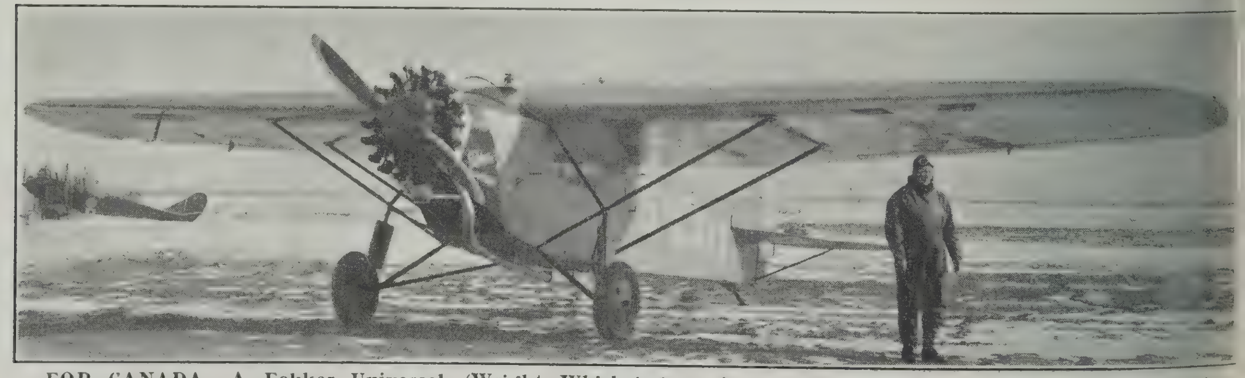
On Jan. 27 an experimental landing of the United Sta Navy's rigid airship Los Angeles (L.Z.126) on the deck of new aircraft-carrier Saratoga was made off the coast Rhode Island.

This apparently was no mere mooring of the airship, involved pulling her down onto the deck and securing there for a period. The success of the experiment gi a vivid idea of the deck space available on the Sarato but otherwise seems to have little utility.

FOKKERS IN CANADA.

Western Canada Airways, of Winnepeg, Man., has plac orders with the Atlantic Aircraft Corporation, of Teterbo Hasbrouck Heights, N.J., for eight Fokker Universal mo planes (200 h.p. Wright Whirlwind engines) and six Fok Super-Universals (425 h.p. Pratt and Whitney Wasp engin The total value of the order is $250,000 (£50,000).

These fourteen aircraft will supplement the present fl of the company, consisting of Fokker Universals and D Moths which have been used during the past year in ma taining a service to the Red Lake mining area and Cent and Northern Manitoba.



FOR CANADA.—A Fokker Universal (Wright Whirlwind engine) at Teterboro', N.J., prior to delivery to Western Canada Airways at Winnipeg by Mr. Bernt Balchen, who is seen standing in front. This machine is one of the fourteen ordered by Western Canada Airways as mentioned above.

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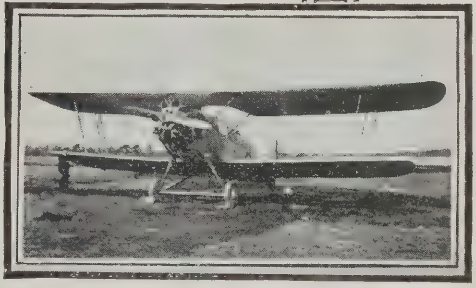

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PERSONALITIES AND OTHERS.

["Who's Who in Aviation." Edited by A. G. Linney and T. Stanhope Sprigg. Airways Publications Ltd. 182 pages. 10s. 6d. net. On sale from THE AEROPLANE Book Dept., 14, Bream's Buildings, E.C.4.]

A publication more or less on these lines has been needed in British Aviation for a very long time, and the thanks of the aeronautical community are due to Messrs. Newton and Co., and Airways Publications Ltd., and the Editors, Messrs. A. G. Linney and T. Stanhope Sprigg, for having made a start on it.

Compiling a Who's Who is at best a precarious business. The compilers are bound to make enemies by leaving out the names of a number of people who think they are Whos who aren't, and they are likewise bound to bring upon themselves a certain amount of scorn for making a number of Aren'ts into Whos, as well as for not drawing a distinction between Who *was* Who and Who *is* Who. Also, necessarily in the first issue of a book of this kind the compilers are bound to omit the names of a number of quite notable people, and to make lamentable mistakes.

One *had* thought of producing a Who's Who oneself. But one refrained, for precisely those reasons.

Taking all these difficulties into consideration, the compilers of this first Who's Who in Aviation have not done so badly, and the book ought to be useful to all who are concerned with aviation. For if they do not find the names of some people about whom they want information, they certainly will find the majority of people who are of importance.

There are some extraordinarily bad mistakes in the book, as for example putting down Sir Hugh Trenchard as Commandant of the Central Flying School from 1914 to 1918, a post which he never held, and omitting his command of the R.F.C. in the Field from 1915 to 1918 and his command of the Independent Force in 1918,—apart altogether from omitting any mention of his Army career before the R.F.C. came into being.

One is puzzled to explain the inclusion in the book of a number of quite unimportant members of Flying Clubs who have only learned to fly within the past year or two and have done nothing whatever to distinguish themselves. If any such were to be included then every member of every Flying Club should equally have been included,—and there would be no excuse for including such names.

A minor mistake is made by indicating the Royal Aero Club by the initials R.A.C., which are generally taken as meaning the Royal Automobile Club, when R.Ae.C. are the initials commonly used for the Aero Club.

Among other curious omissions one finds Lord Edward Grosvenor mentioned as a Flight Commander, R.N.A.S., but not as a Squadron Leader commanding No. 601 (County of London) (Bombing) Squadron. Squadron Leader the Right Honourable F. E. Guest, commanding No. 600 (City of London) (Bombing) Squadron is omitted altogether, as are the officers commanding the other Auxiliary Squadrons. Naturally one would not expect all Squadron Leaders in the R.A.F. to be mentioned, but one would suggest that as the book is primarily of civilian interest, the officers commanding the Auxiliary Squadrons should be included in future issues.

The names of a number of foreigners who have no connection with British Aviation are mentioned, and one suggests that they should be omitted in future, for if one foreigner is to be included the whole personnel of foreign aviation should likewise appear. Either the book must be *Who's Who in British Aviation*, or it must be a book about the size of the general *Who's Who*, so as to include everybody who is anybody in aviation everywhere.

The book will need a great deal of revising in future issues, but, as one has said, it is quite useful as it is. Also a good deal of humour can be got out of reading the descriptions under the various names, in view of the fact that most of them are written by the people under whose names they appear.

Apart from the *Who's Who*, there is quite a useful Directory of Societies and Institutions concerned with Aviation in this country, and also a list of Light Aeroplane Clubs and a list of aircraft firms.—C. G. G.

THE FLYING SERVICES IN THE FIELD.

["Letters from a Flying Officer." By Rothesay Stuart Wortley. 207 pages, frontispiece portrait of the Author. Oxford University Press. Supplied by THE AEROPLANE Book Department, 14, Bream's Buildings, E.C.4. 8s. 6d. net.]

Rothesay Stuart Wortley, the author of this delightful book, was a Staff Captain of an Infantry Brigade and joined the Royal Flying Corps in 1917. He served with No. 22 Squadron, R.F.C., in France and after a period with a training Squadron at home he returned to France in September, 1918, to command No. 88 Squadron, R.A.F. The book consists of a series of letters which are supposed to have been written by a distinguished officer of the R.F.C. to various people and collected by his widow and annotated by a brother-officer for the benefit of the writer's school-boy son. Major Wortley wrote the book in the period between leaving the Service and his death in 1926 and undoubtedly some of the letters, or at any rate extracts from them, written by the fictitious Colonel Enderby, are taken from the author's own correspondence.

The letters breathe the spirit of the R.F.C. in the Field and with the explanatory notes make the book into an accurate and entertaining history of the war in the air. Many of the tales in it have been told and re-told where flyin men are gathered together, but they gain immortality Major Wortley's book. He pays just tribute, but no mo than just tribute, to all ranks of the Flying Services, fro the first Squadrons with the Expeditionary Force in Augu 1914, to the long-distance bombing Squadrons of the Ind pendent Air Force in November, 1918, but his fullest admi tion and his greatest praise goes, as it always went, with t personnel of the Flying Services, to the Infantry.

In a letter dated July 31, 1916, "Colonel Enderby" scribes a day he spent up the lines. He writes: "We ha all had a bit of a doing during the last week, and the ed has gone forth that we should all take a day off in tu But, by God, if we've had a doing, it's nothing to comp with what the infantry, gunners, and sappers have go through!" Later in the same letter, quoting a discussi with an Infantry officer, he says: "We were both fighti the same enemy—he on the ground and I a few hundr feet above his head. But those few hundred feet constitut an abyss almost unbridgable. We had not the remot notion of each other's feelings. I wish it could be arrang that infantry officers could be attached to the R.F.C. un and *vice versa*. A week spent one with the other would much to make the two arms appreciate each other's point view and instil mutual confidence."

The descriptions of fighting in the air have never been m vividly written. It is literally impossible to put the b down once one has started it. His experiences include slow duels of the early days when all the shooting had to done over the tail of the machine, to the massed combats huge formations towards the end of 1918.

The difficulties of a Squadron Commander whose est lishment is being maintained with half-trained pilots, of the vital problems of the latter part of 1917 which has so often heard discussed, but has never seen in p before, is described in a letter dated Dec. 30, 1917:—"I rather worried about some of the pilots that have b sent out here lately. They are not so good as they mi be. To start with, they can't *fly* . . . at least not enough to be allowed to cross the lines. I know that consequence of the rapid expansion of the R.A.F., it is easy matter to turn out pilots in sufficient quantities meet the ever-growing demands to man the newly-for squadrons, as well as to fill up the gaps caused by cas ties. But the fact that some of the reinforcements sent to us are insufficiently trained cannot in justice be ascri to the above conditions. To send them out to squadron the field in a state of unfittedness to perform their pr share of the work of the squadron is not only unfair to 'young entry' themselves, but also unfair to the fl commanders under whose orders they come, and who responsible for their efficiency. It is also unfair on t fellow flying officers, who have to bear the burden of extra work due to their having to take the places in patrols which the former are yet unqualified to fill."

The author never forgets to record his appreciation of work of the ground staff, whose efficiency and inexha able energy contributed so largely to the success of all operations.

Letters from a Flying Officer should be read by all R.F.C. pilots, because they will enjoy a reminiscence w is without distortion. It should be read by the ri generation of pilots, because it will teach them much they ought to know, and it should be read by the gen public, because it records, not the alcoholic and other cesses of certain "Stepsons" of the R.F.C., but the work of a Fighting Service by a modest, thoughtful, gallant son of the Service. C. M. M

LITERATURE FOR THE ILLITERATE.

["Perilous Days." True Tales of Adventure. By D Masters. 276 pages, 26 illustrations, index. John L Supplied by THE AEROPLANE Book Dept., 14, Bre Buildings, E.C.4. 8s. 6d. net.]

One had hoped, and believed, that the "intrepid-bird school of journalism had breathed its last somewhere a 1920, but apparently there is a kick left in it still. *Perilous Days* we have a sketchy distortion of one or tw the paragrahs of *The London Gazette* of 1914-18 freely m with some of the less entertaining stories invented for edification of guileless journalists by the flying peopl those days, mixed into a long, insipid whole by Mr. D Masters. This part of the book is called "Youth on Wing." Other chapters describe, in the peculiar styl popular journalism the various attempts, successful otherwise, to fly across the Atlantic.

Aviators do not have all the glory in this book, alth they have a good two-thirds of it. The perils of coal-mi and sea-faring people in peace and war have not been ign It might be possible to find a small boy sufficiently sophisticated to appreciate this book.—C. M. MCA.

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sed as the flag-ship on the recent Baltic Cruise of British lying Boats, and carrying the Secretary of State for Air, the Iris II" proved herself an exceptionally seaworthy craft of igh performance both in the air and on the water, and ccomplished the cruise with complete efficiency under very dverse weather conditions

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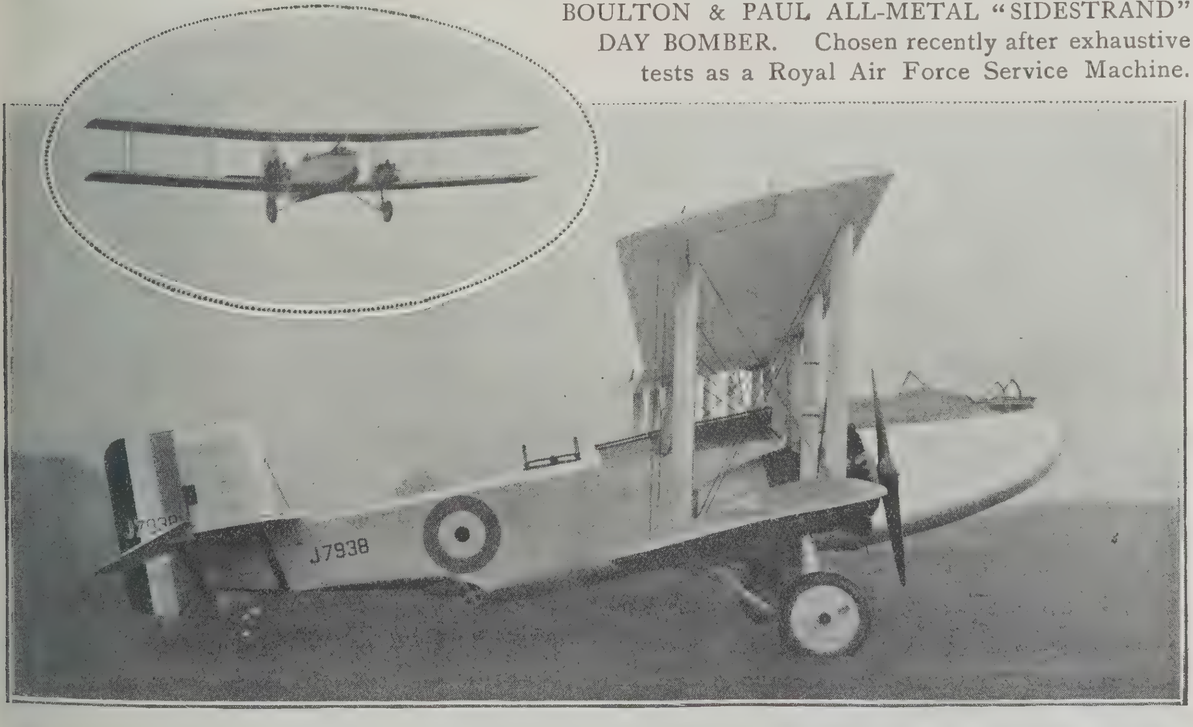

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FRENCH NAVAL AVIATION.

The French aircraft carrier *Béarn* has been commissioned and is now undergoing extensive trials.

This vessel was originally laid down in 1914 as a battleship of the *Normandie* class. Constructional work was held up during the war and in 1920 it was decided to convert it into an aircraft carrier. In its present form it displaces 21,000 tons, is 576 feet long with a maximum beam of 89 feet, and has a speed of 21.5 knots.

In general appearance it resembles the latest British and American aircraft-carriers in that the entire deck forms a vast landing and taking-off area, with the single funnel, bridges, etc., mounted on the starboard side completely clear of the deck. The main hangar 400 ft. long by 21 ft. high is connected to the flying deck by electric lifts. Armament consists of eight 6.1 in. guns, six 75 m/m. and eight 37 m/m. A.A. guns and twelve machine-guns.

It has accomodation for forty aircraft of the four following types: Levasseur (type Levy-Biche) single-seat fighters (330 h.p. Hispano-Suiza engine); Levasseur two-seat fighters (450 h.p. Lorraine-Dietrich or Hispano-Suiza engine); Levasseur three-seat reconnaissance biplanes (450 h.p. Lorraine-Dietrich engine), and Levasseur two-seat torpedo-carriers (600 h.p. Farman engine).

All these machines have been specially developed by shipboard work and the first three are of the species designated "type *Marin*" in which the fuselage is so constructed to enable the machines to alight in the sea.

The aircraft unit in the *Béarn* is commanded by *Capitaine de Vaisseau* de Laborde.

In commenting on the flying trials with this vessel the French paper *Les Ailes* remarks that "it is very much easier to fly off the deck than to land on it. In spite of the ingenuity of the very complicated apparatus for pulling-up aircraft, breakages are frequent and the number of forced baths noticeable. One is informed that this is not the fault of the pilots but is due to the method that is imposed on them for landing."

The *Béarn* is being used as an experimental ship and it is reported that subsequent ships will be of approximately 10,000 tons with a speed of 34 knots to enable them to operate with the new French light cruisers.

The French Navy is completing an aircraft transport, the *Commandant Teste*, which will be essentially a seaplane-carrying ship. Seaplanes will be slung over the side by crane to take-off in the normal manner. It will also be equipped with two catapults for the discharge of small single-engined flying-boats of the Schreck type.

It will displace 10,000 tons and have a speed of 20.5 knots. Armament will consist of six—5.4 in. guns and several A.A. guns and in addition it will carry twenty torpedoes for the use of the Farman Goliath torpedo-carrying seaplanes which will form part of its equipment.

The French light cruiser *Primauguet* has just returned from an eight-months' cruise round the world. This vessel is equipped with a catapult and a Schreck-F.B.A. flying-boat (180 h.p. Hispano-Suiza engine). During the cruise a large number of demonstration flights were made by *Lieut. de Vaisseur* Demougeot, representing 100 hrs.' flying under all weather conditions without the slightest mishap. Throughout the cruise the flying-boat remained on the catapult without any other shelter than that provided by engine and cockpit covers.

THE U.S. MARINES IN NICARAGUA.

In the course of the operations which are being conducted by the U.S. Marine Corps in Nicaragua, an Air Unit of the Marine Corps has been giving considerable assistance to ground forces in its action against the local rebels.

In December a small force of Marines was ambushed b party of rebels at Quilali, and eighteen were wounded, r seriously, and their immediate evacuation was necessary save their lives.

The surrounding country was passable only on foot by pack mules, and the only fairly level spot for miles the road running through the village of Quilali.

A ground message was picked up by aircraft and p and shovels were dropped to the ground troops who cle a space 70 feet wide by 300 feet long by demolishing native huts on one side of the village street.

Lieut. Schilt, U.S.M.C., on a Vought Corsair (425 h.p. P and Whitney Wasp engine) flew from the air base at Mana and by using this rough clearing succeeding in evacuat all the wounded in 12 trips, in the face of hostile mach gun fire from the surrounding hills, to Ocatal some 25 m away.

It was impossible to make ordinary landings owing the roughness, shortness, and narrowness of this clear and it was necessary to "drop" into the space every t On his eighth landing he demolished his tail skid, and his ninth an interplane strut was bent. This was straighte with an axe and bound with splints and wire.

All the wounded were subsequently evacuated from Oc to Managua in a Fokker Transport monoplane (three Wr Whirlwind engines).

AN INTERESTING ENGINE.

Rumour has it that a new engine, designed by Mr. F Hailford, who produced the Cirrus, is shortly to be tes This is said to be a 12-cylinder, flat, double-opposed, air-co job.

There is much to be said for a flat engine, especially f twin-engined pusher machine. The cylinders can be sto practically inside the wings and the airscrews can be car out to the trailing edge fairly simply. This may, after be the answer to the problem of making a quiet and passenger-carrier.

THE ALL-METAL AIRSHIP.

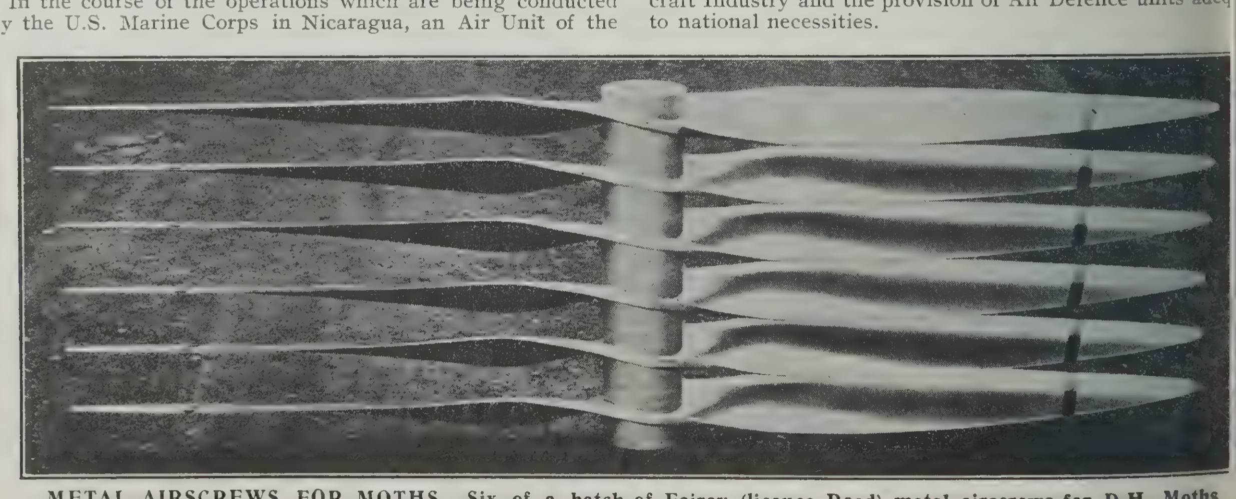
The latest news from Detroit is that the stern section of all-metal airship which is now being completed by the craft Development Corporation has passed an air-pressure at three times its normal operating pressure without any of leakage. As the pressure was maintained for two w there seems good reason to believe that the firm have so the problem of making gas-tight joints in metal.

The production of the ship has been somewhat delaye changing over from the aluminium alloy originally use the new metal made by the Aluminium Company of Ame which is called "Alclad." A year's testing indicates th is entirely free from inter-crystalline corrosion. This is only problem which has really worried the constructors, now that has been solved they are confident of success.

THE CANADIAN AIR LEAGUE.

At a meeting held in Ottawa on Jan. 23, which was atte by fifty delegates drawn from all parts of Canada, Canadian Air League was formed. The Chairman of Executive Committee is Major-General J. H. MacB lately Chief of the Canadian General Staff.

The objects of the League are the development of mercial and civil air services, the encouragement of an craft Industry and the provision of Air Defence units adeq to national necessities.



METAL AIRSCREWS FOR MOTHS.—Six of a batch of Fairey (licence Reed) metal airscrews for D.H. Moths ready for delivery to the De Havilland Aircraft Co. Ltd. The shadows on the blades show a uniformity of section and angle in a novel and convincing manner.

TOWARDS PORTUGUESE INDIA.

. C. E. Bleck, of Lisbon, has continued to make steady ineventful progress on his flight to Goa.

left Bizerta on the D.H. Moth C-PAAA (Cirrus engine) uesday, Feb. 14, and flew to Tunis. On Wednesday he to Tripoli in five hours. From Tripoli to Sirte took and a-half hours on Thursday, on Friday he flew on ngazi, in four and a-half hours, on Saturday he reached uk, and on Sunday he flew from Tobruk to Cairo.

THE MOTH IN EAST AFRICA.

Feb. 16, Lady Carbery flew from Mombasa to Nairobi, stance of about 270 miles, in her D.H. Moth (Cirrus ie), carrying Capt. E. M. Kenealy, a member of the a Legislative Assembly, as passenger.

is is the first flight that has ever been made between two places and the first flight made by a woman in Africa.

THE MOTH IN NEW ZEALAND.

Feb. 17 the first D.H. Moth to arrive in New Zealand anded at Wellington.

is machine, G-NZAT, belongs to Mr. F. D. Mill, who ust returned from England after a stay of four or five hs during which time he learned to fly, took his "A" "B" licences and his Ground Engineer's certificates at De Havilland School.

has established the Air Transport and Survey Company ew Zealand. This company will engage in air survey , maintain a fleet of taxi machines, and it also intends en a flying school at Auckland. In addition this com- will act as agents for the Moth in New Zealand.

A LIGHT AEROPLANE TOUR.

Jan. 21 two Americans, Messrs. Seypelt and Kern, ed back at Sindelfingen after having completed a tour estern Europe on a Klemm-Daimler L-20 two-seat light plane (20 h.p. two-cylinder Daimler engine).

ey covered a total distance of 6,000 kms. (3,726 miles) visited the following places: Frankfurt, Cologne, Brus- Paris, Lyon, Marseilles, Nice, Genoa, Rome, Venice, enfurt, Vienna, and Munich.

INSTRUCTIONAL.

pos the refresher course which the Director of Civil Aviation luring at Hendon, *The Evening News* of Feb. 18 says:—"His ctional machine is a little Gent-Moth." Well! Traditionally he little gent-moths which do most of the allegorical fluttering. why doesn't somebody produce a light aeroplane called the Bird?

THE FLYING CLUBS.

The London Aeroplane Club.

: H. E. Perrin, 3, Clifford Street, London, W.1.]

rt for week ending Feb. 19.

ng Time: *Dual Instruction* 17 hr. 50 min. *Soloists* 12 hr. 40 *Dual Instruction.—With Mr. F. G. M. Sparks*—Miss Fletcher, V. H. Lane, Major Mason, Messrs. C. E. Murrell, W. L. M. nor, R. Hayes, E. A. Lingard, G. Black. *With Mr. S. L. F. rbe*—Miss H. Cholmondeley, Mrs. Fraser, Miss Fletcher, Messrs. ck, S. Hansel, C. Peckham, J. P. Edinger, A. P. Glenny, P. W. A. O. Wigzell, L. Rowson. *Soloists.*—Messrs. J. J. Hofer, nders Clark, Sq. Ldr. M. E. A. Wright, Messrs. W. L. M. nor, P. W. Hoare, G. W. Hall, B. B. Tucker, Major H. Petre, H. B. Michelmore, E. E. Stammers, O. J. Tapper, C. E. ll, W. Hay, M. L. Bramson, W. L. Ballantyne, H. Solomon, Samuelson, Rich Hayes, E. A. Lingard. *Passenger Flights.*— *Mr. S. L. F. St. Barbe*—Miss H. Cholmondeley, Miss V. ondeley, Mr. N. F. Shelley. *With Mr. F. G. M. Sparks*— H. Sutton, D. Robertson, Mrs. D. Black, Miss Walton. *With E. Stammers*—Miss Maddock, Miss Stammers. *With Mr. Tapper*—Mr. R. C. Richmond, Miss H. Cholmondeley. *With r. M. E. A. Wright*—Mr. G. W. Hall. *With Major H. Petre*— Fraser. *With Mr. W. Hay*—Mrs. Davis. *With Mr. W. T. W. tyne*—Miss Fowkes.

improved weather conditions of Saturday and Sunday resulted nsiderable activity at the Club during the week-end and we able to get in 26 hours flying on the two days. Messrs. M. O'Connor and E. A. Lingard flew solo for the first time r. H. M. Samuelson passed the necessary tests for his Pilot's e.

bers Meeting.—The attendance of members at the General meet- the 15th instant was very satisfactory, and the suggestion that Meetings should be held at more frequent intervals met with animous approval of the members present and the Committee Club. It was purely an informal gathering and members were every opportunity of putting forward their views as to the policy of the Club.

pers took full advantage of this opportunity and many valu- iggestions were submitted for the consideration of the Com-

as pointed out that the Committee had under review certain ls for extending the activities of the Club, and that these ls would be submitted to the members at a later date.

The Lancashire Aero Club.

: Woodford Aerodrome, near Stockport.]

t for week ending Feb. 18.

g Time 22 hr. 10 min. *Instruction* 8 hr. 55 min. *Soloists* 7 hr. *Passenger Flights* 4 hr. 30 min. *Tests* 1 hr. *Instruction.*—

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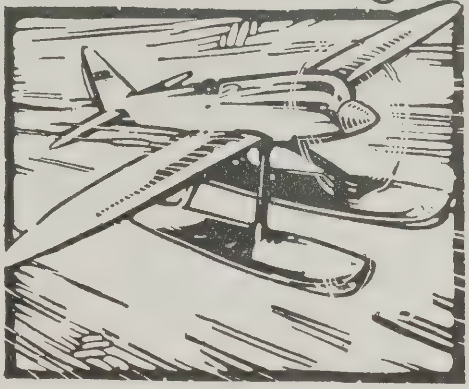

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With Mr. Baker—Messrs. Cohen, Tweedale, Hall, Benson, Harber, Brooking, Goss, Davison, Crosthwaite, Michelson, Gort, Ward Secker, Fallon, Weale, Hardy, Stern, Meads. *With Mr. Cantrill*—Miss Baerlein, Messrs. Gort, Michelson. *Soloists (under instruction).*—Messrs. Cohen, Browning, Gort, Hall. *Pilots.*—Messrs. Nelson, Michelson, Meads, Davison, Crosthwaite, Twemlow, Ward, Hardy, Caldecott. *Passengers.—With Mr. Baker*—Messrs. Harrison, Sweeney, Leach. *With Mr. Twemlow*—Miss Jump, Mrs. Mortimer, Mrs. Twemlow, Mr. Hall. *With Mr. Cantrill*—Mrs. Brimelow, Dr. and Mrs. Stross, Mrs. Bishop, Miss Busby, Mr. Faulkner. *With Mr. Goodfellow*—Mr. Hall. *With Mr. Lacayo*—Messrs. Mills, Whitehouse, Rennison, Browning.

Notes.—The air was thick with fog-fumes and aerofoils this week-end, all the machines being serviceable together for the first time this year. Mr. Caldecott obtained his "A" Licence and Messrs. Cohen, Gort and Hall accomplished excellent first solo flights.

Unfortunately Mr. Anderson, one of our private owners, met with misfortune on the Saturday. While flying LV cross-country with Mr. Lacayo they were caught by a strong down-current and compelled to land on a hill-side. The machine turned over, but neither of the occupants was injured.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Feb. 19.

Flying Time 16 hr. 55 min. *Instruction* 6 hr. 30 min. *"A" Pilots* 8 hr. *Passengers* 1 hr. *Tests* 40 min. *Soloists* 45 min. *Under Instruction.—With Mr. Parkinson*—Messrs. Percy, V. Heaton, Brown, Runciman, Griffiths, Horn. *Advanced Dual.*—Mr. De Pledge. *"A" Pilots.*—Dr. Dixon, Mr. D. Wilson, Mrs. Heslop, Messrs. C. Thompson, H. Ellis, J. D. Irving, R. N. Thompson, Turnbull, Mathews, L. C. Davey, A. Bell. *Soloists.*—Messrs. De Pledge, N. Horn. *Passengers.—With Mrs. Heslop*—Messrs Luckman, C. Thompson. *With Mr. C. Thompson*—Mrs. Heslop, Messrs. Bulmer, Luckman, J. Todd, O. Robson, Mrs. White. *With Mr. H. Ellis*—Mr. Mechan. *With Mr. R. N. Thompson*—Mrs. Rutherford. *With Dr. Dixon*—Miss Dixon. *With Mr. A. Bell*—Miss Bulmer, Messrs. Keath, J. Bell. *With Mr. J. D. Parkinson*—Dr. Grensell, Messrs. W. White, Hayton.

Flying was possible only for a short time on Tuesday and Thursday, but Sunday proved quite good and of the week's total 14 hr. 30 min. was completed on that day. Mr. Horn carried out his first solo flight in excellent style on that day, the first it has been possible to launch a pupil this year. The Club's fleet of three Moths was never idle throughout the day except during the lunch hour.

On Feb. 26 the Forced Landing Competition for the Cup presented by Mrs. J. D. Irving takes place and it appears that this will be an interesting contest, as all the regular flying pilots have entered. The competition is confined to *ab initio* pilots and will be won outright. There will be no danger to the Moths as Mr. Parkinson will occupy the passenger's seat. There have not been any applications for his post, which certainly should be interesting at least.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Feb. 18.

Flying Time 4 hr. 35 min. *Instruction* 2 hr. 25 min. *Soloists* 1 hr. 40 min. *Passengers* 30 min. *Instruction.—With Mr. Beck*—Messrs. Ambler, Ellison, Humpheries, Arthur Senior. *"A" Pilots.*—Messrs. I. Thomson, Wood. *Passengers.—With Mr. Beck*—Messrs. Blackburn, Miller.

Our activities have been confined to one machine and one day's flying this week. However, to-day (Sunday) looks highly promising and we hope the Weather Clerk will be more kind to us than of late.

We hope to have G-EBSV back about the middle of the week when we may be once again in the running with the London Club in the matter of flying hours.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending Feb. 18.

Flying Time 13 hr. 22 min. *Dual Instruction.—With Mr. McDonough*—Messrs. E. P. Lane, C. W. Fellowes, G. Aldridge, E. Wynn, H. Lattey, G. Robson, S. Hall. *Soloists.*—Messrs. W. Swann, R. L. Jackson, C. Fellowes, S. H. Smith, R. L. Brinton, G. Brinton, H. J. Willis, E. J. Brighton. *Passengers.—With Mr. Brighton*—Messrs. G. Buckle, A. Ackling. *With Mr. Jackson*—Messrs. L. V. Mann, S. H. Smith, E. Wynn.

Mr. McDonough, who has been Chief Instructor since the Club began operations as one of the Approved Light Aeroplane Clubs, is leaving us at the end of the month to take up an appointment in Canada. His successor will be Flt. Lt. T. Rose, D.F.C., R.A.F.O.

[Flt. Lt. Rose went onto the Reserve in September, 1926. He served with the R.F.C. in France during the War and was awarded the D.F.C. The *London Gazette* of Nov. 2, 1918, states:—"This officer has accounted for nine enemy machines during recent operations. Possessing in a marked degree the real offensive spirit he sets a notable example to the other pilots of his Squadron by his utter disregard of personal danger." After the Armistice he was posted to No. 27 Squadron, India, and in 1922 he was posted to No. 1 F.T.S., Netheravon. In 1925 he served with No. 29 (Fighter) Squadron and No. 43 (Fighter) Squadron. Flt. Lt. Rose played Rugby football for the R.A.F. in 1923-4-5-6 and was Captain of the Henlow team which won the R.A.F. Cup in 1926.]

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Feb. 19.

Flying Time 17 hr. *Instruction* 7 hr. 55 min. *Soloists* 6 hr. 35 min. *Passenger Flights* 1 hr. 50 min. *Tests* 40 min. *Instruction.—With Flt. Lt. F. A. Swoffer*—Mrs. Ranald, Messrs. Cierva, Cooper, Kerry, Watson-Taylor, Southcliffe, Baynes Perfect, Lowe-Wilde, Shepherd, Richardson, Puttock, Bull, Heath, Cripps, Kirby, Courtney, Mandeville, Scott-Hall, Curtis-Nuthall, Dickson, Grosvenor. *Soloists.*—Messrs. Cierva, Cooper, Kirby, Lowe-Wilde, Shepherd, Cripps, Southey, Flt. Lt. Crawford, Fagan, Bowen, Wells, Parker, Oliver, Heath. *Passengers.—With Mr. Oliver*—Miss Anderson. *With Flt. Lt. Crawford*—Miss Grace, Miss Hancock-Steil. *With Mr. Bowen*—Mrs. Waterman. *With Flt. Lt. Swoffer*—Miss Marriot.

Flying was only possible Tuesday, Saturday and Sunday. We have now two machines and hope to have a third next week, as Flt Swoffer is collecting a Moth from Stag Lane on Monday.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwich.]

Report for week ending Feb. 19.

Flying Time 6 hr. 15 min. *Instruction.—With Mr. Lines*—M G. Watson Parker, G. Parker, N. Brett, N. Lindley, C. Go *Soloists.*—Messrs. R. Moore and F. Gough. *Passengers.* Speechley, Messrs. Alexander, P. Townshend, and H. Gree.

Another week of bad windy wet weather has kept our flying down to a minimum and very little indeed has been possible on Saturday and Sunday. Sunday, of course, was an ideal and a large gathering of members and friends were prese the aerodrome. A visiting Westland Widgeon monoplane was a attraction, especially to the soloists. The machine was in th practically the whole of the afternoon.

[A visit by a member of the staff of THE AEROPLANE to the N and Norwich Aero Club coincided with the partial demolitic the Club's only Moth. Preparations were being made to ta number of boys from the North Walsham Grammar School for flights. The first object of this worthy piece of propaganda being fitted into the front seat of the Club's Avro when he his hand on the throttle. Unfortunately, although the engin running, the chocks were not in place and the Avro made a attack on the Moth which was standing near and carved its through the trailing edge of the Moth's top plane. Capt. Ra who was in charge of the Avro, managed to switch off the before further damage was done, but the Club had to spen first fine day for weeks without their Moth.

The member of the staff of THE AEROPLANE, while apologisin acting in the capacity of a Jonah, would like to remind the that the invariable use of chocks is the classic method of prev such disasters.]

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Feb. 19.

Flying Time 10 hr. 30 min. *Instruction.—With Mr. Lowdell* Rhodes, Miss Creasy, Miss Edwards, Messrs. H. Billinton, K. R Brown, F. Jolly, G. Smith. *Passengers.—With Mr. Lowdell* Courtney Prentice, Mr. C. Hanson, Miss Heckmonthwait, Miss Lo Messrs. Chadwick, Brittain, Mrs. Wardel, Miss Birch. *Wi Prentice*—Mrs. Taylor, Miss Thompson, Mr. E. Croydon. *Sol* Dr. Jas. Sleigh, Messrs. S. Schofield, C. N. Prentice.

Notes.—Mr. Lowdell, who has devoted all his spare time for th four months as the Club's voluntary instructor, has now secur release from the R.A.F. and has been engaged by the Club as instructor. The aerodrome will from now onwards be open struction every day except Fridays. Members please note.

On Sunday Flt. Lt. Comper, of the Felixstowe Light Aeroplane flew over in their C.L.A.4 and gave joy-rides to several of members.

Sunday was a perfect day and we managed to get in six flying.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Feb. 18.

Flying Time 14 hr. 35 min. *Instruction* 4 hr. 45 min. 9 hr. 15 min. *Passengers* 35 min. *Under Instruction.*—Major Messrs. Arnold, Inskip, Bryan, Roberts, T. H. Clarke, and Bathurst. *Soloists.*—Messrs. Downes-Shaw, Arnold, Jopp, T. H. Clarke, Hall, and H. C. H. Bathurst. *Passengers.—Wi E. Hopper*—Mr. Rowbottom. *With Mr. S. K. Jopp*—Miss Van S

Flying was possible only for part of Sunday and all Saturday weather from Monday to Friday is best described in words though terse and expressive, have not, as yet, been adopted official reports of the Meteorological Office.

Preliminary work in preparation for the Air Pageant to here on May 5 is well advanced.

The Johannesburg Light Aeroplane Club.

On Oct. 29, 1927, the Johannesburg Light Aeroplane Clu officially inaugurated by the Mayor of Johannesburg at the warrath aerodrome.

Their first machine, a D.H. Moth (Cirrus) had arrived days previously from Roberts' Heights, Pretoria, where it ha assembled by the South African Air Force.

After this machine had been ceremoniously baptised "Alph the Mayor, Mr. Alf Law Palmer, it was turned over to pas carrying.

The Club Instructor, Mr. G. Bellin, is a South African pil served in the R.F.C. during the War.

On Nov. 20 the Club took delivery of its second D.H. Moth had acquired through Mr. Veasey, the South African D.H. agen machine has been christened "Beta."

FLYING SCHOOLS.

The De Havilland Flying School.

Report week ending Feb. 19.

Flying Time 60 hr. *Instruction.*—Dual, 11 hr. 15 min; Solo, 45 min. *Passenger Flights and Hire Service.*—28 hr.

The Henderson Flying School.

Report for week ending Feb. 16.

Flying Time 8 hr. *Dual Instruction.*—5 hr. 35 min. *Solo tion.*—2 hr. 25 min. *Dual.—With Mr. H. D. Davis*—Mrs. Messrs. Liniker, Crabtree, Whitley, McCabe, D. Van *Soloists.*—Messrs. Crabtree, Patton, Bethun, Dr. Wall.

We must congratulate Dr. Wall on his masterly Solo a Crabtree on completing his test for his "A" Licence.

Mr. Crabtree finished his test by taking his machine to The descent was most spectacular—half-rolls and vertical ending with a side-slip landing.

Capt. H. D. Davis flew two greyhounds to the Bellevue R Saturday and upon shutting off the engine and side-slipping small field, one of the dogs got windy and attempted to pilot.

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THE "AEROPLANE,"
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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 11; Tuesday, 16; Wednesday, 10; Thursday, 9; Friday, 9; Saturday, 16; Sunday, 4.

Imperial Airways Ltd. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne : Machines 31, passengers 191, freight 12 tons.
Air Union :
Paris—London : Machines 16, passengers 73, freight 14 tons.
K.L.M. :
Amsterdam—Rotterdam—London : Machines 13, passengers 26, freight 4½ tons.
Sabena :
Brussels—London : Machines 8, passengers 3, freight 1 ton.
Deutsche Lufthansa AG. :
Amsterdam—London : Machines 6, passengers 6.
Private :
Machines 0, passengers 0.

Total number of trips by British Machines, 31, carrying 191 passengers. Foreign Machines, 44, carrying 108 passengers.

COMPARATIVE FIGURES.

Week ending Feb. 19 :
Machines, 75; Passengers, 299; Crews, 144; Total personnel, 443.
Corresponding week, 1927 :
Machines, 36; Passengers, 57; Crews, 59; Total personnel, 116.
Corresponding week, 1926 :
Machines, 74; Passengers, 177; Crews, 91; Total personnel, 268.
Corresponding week, 1925 :
Machines, 67; Passengers, 120; Crews, 84; Total personnel, 204.
Corresponding week, 1924 :
Machines, 68; Passengers, 113; Crews, 113; Total personnel, 226.
Corresponding week, 1923 :
Machines, 42; Passengers, 102; Crews, 76; Total personnel, 178.
Corresponding week, 1922 :
Machines, 45; Passengers, 81; Crews, 74; Total personnel, 155.
Corresponding week, 1921 :
Machines, 30; Passengers, 32; Crews, 38; Total personnel, 70.

Croydon Notes.

A new Fokker of the F.8 type with two Jupiter engines has started running on the K.L.M. service during the past week. This machine bears the registration H-NAED. It resembles the earlier F.8 (H-NADU) which was for a time in service last year in external appearance except for the tail unit. H-NADU it will be remembered came to grief owing to a failure of the fin-post bracing, and the new machine has steel tube bracing throughout the tail.

On Thursday, Feb. 16, piloted by M. Silivis, this machine made the trip Croydon—Rotterdam in 75 minutes by the pilot's stop watch. This represents time from leaving ground to touching ground again, and is rather less than the official time between arrival and departure. By either time it was a quick trip.

Quick trips have been much in evidence this week and slow ones also. On Friday, of the nine machines which arrived or departed from Croydon, only two (both incidentally belonging to Imperial Airways) were inward bound. Helped by a westerly gale, the 8 o'clock W.8 bound for Paris made the journey in 1 hour 46 minutes, and the midday outward trip—made by the Handley Page Hampstead—took only 1 hour 20 minutes to reach Le Bourget. The two inward trips from Paris, one by a W.8 and the other by an Argosy, were naturally correspondingly slow.

On Friday Flt. Lt. R. E. H. Allen, who is concerned with the development of mechanical transport for the R.A.F., brought down a special aerodrome tractor to demonstrate its usefulness for the handling of civil machines.

This tractor, which is concocted from the cut-down chassis of a Crossley tender, has two Kegresse-type tracks and no front wheels. Steering is accomplished by partial or complete braking of the track on one or the other side. With one track locked the machine simply spins on the locked track, and consequently it is amazingly manœuvrable.

The chassis carries at the rear a hydraulic ram gear attached to a system of clips which can be attached to a steel tube which is built into the tail of certain machines—among them the Vickers Vanguard—to suit this particular method of handling. These clips on the tractor can be attached with the tail-skid on the ground. The ram will then raise the tail to any desired height, when it can be locked, and the tractor can then manœuvre the machine into and out of the m
complicated positions.

For machines which have not the special tail attachm
a small tail-skid trolley is attached to the tractor, and
tail-skid has then to be lifted on to the trolley. In m
cases the ram-gear can be used to do the lifting. Two
and the tractor therefore can handle a machine which wo
require a party of at least half-a-dozen men in the ordin
way.

The performance of this machine was certainly convinc
and there certainly ought to be one of them at Croydon

AN ERROR OF DATE.

In Croydon Notes last week it was stated that Mr.
Lear Black was unable to start on his trip to the Riv
on either Friday, Feb. 10, or Saturday, Feb. 11, owing to
weather. This statement was the result of a misundersta
ing. Mr. Black did leave Croydon despite the weather
Saturday, Feb. 11, and not on Sunday, Feb. 12.

Apart from this definite error it has been pointed out
the reference in the same issue of The Aeroplane to
Black's failure to reach Moscow conveys a wrong impress
In a paragraph under the heading The Retreat from Mos
it is said that " a distinct lack of cordiality as to his
was shown by the Soviet authorities." Actually no sig
discourtesy to Mr. Black was shown by these authorit
Their discouragement of his proposal was framed entirely
the state of the weather and the landing grounds in Rus

MR. HINCHLIFFE'S LATEST.

Some time ago The Aeroplane attempted to solve the pu
of the whereabouts of Mr. Hinchliffe, who, while suppo
to be on sick leave in Holland, was interviewed by an Am
can newspaper *in* America. Eventually Mr. Hinchliffe arri
from America, and shortly afterwards left the employ
Imperial Airways, by mutual consent—as his ambitions
dently soar above being an aerial 'bus-driver.

Now one gathers that Mr. Hinchliffe—presumably as
result of his visit to America—has parked at Brookland
Stinson monoplane with a Wright Whirlwind engine, in wh
rumour states he is to attempt to fly non-stop to Rang
One wishes him luck, and one only regrets that he co
not find an English machine in which to make the atten

GERMAN AIR LINE EXTENSIONS IN THE EAS

According to a correspondent of *The Morning Post* an
service between Teheran and the Persian Gulf is likely to
operated in the near future.

The Junkers Co. are already running commercial air
vices in Persia under an exclusive agreement with the Per
Government. These services already connect Teheran
Batum, and link up with the " Ukrvozdukhput " line to
cow, and thus give a connection, through the Deruluft
vice, to Berlin.

Thus when the service to the Persian Gulf from Tehe
is in being it will be possible to travel by air from Eu
to places on the Gulf nearer to India than Imperial
ways' present Eastern Terminus at Basrah by a Gern
Russian service.

The same correspondent also states that a regular ser
from Berlin to the Pacific coast is to be started, prob
during this year. Two Junkers machines have already fl
right through from Berlin to Pekin, and there is no d
that German interests hope to put such a service into op
tion.

THE MOTOR-CAR SPEED RECORD.

Captain Malcolm Campbell's success in setting up a Wo
Speed Record for cars of 206.96 m.p.hr. at Daytona Be
Florida, on Feb. 19, when he beat Major Segrave's recor
202 m.p.hr., is in numerous ways a triumph for the airc
community over the orthodox motor-car people.

To begin with, both Major Segrave and Captain Camp
were R.A.F. pilots during the War 1914-18, and started t
record-breaking schemes with ideas of speed derived f
aeroplanes instead of from slow-going earth-bound vehi
In addition, Capt. Campbell was one of the very early ex
menters with aeroplanes, having built a quaint monoplan
his own away back in the Dark Ages of Aviation,—w
machine he actually flew short distances.

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jor Segrave's triumph last year was achieved with two eam engines, of a type originally intended for aircraft. Campbell's record has been made with a Napier engine ar to those which were used in the Schneider Trophy ines. So two British aero-motor firms have the credit of ting America's best. There is particular satisfaction is latest record, because the Napier firm was about the British motor company to achieve success with high- vehicles, a Napier car having won the Gordon Bennett in 1901.

articularly telling point for aviation is the fact that the nline shape of Capt. Campbell's car,—with its enor- fin to prevent it from yawing—was worked out in the rs wind-tunnel at Weybridge. And the aeroplane sur- ype radiators were designed and built by the Fairey ion Co. Ltd., at Hayes.

ier equipment included B.T.H. magnetos, Claudel- on carburettors, K.L.G plugs and, of course, Wake- s Castrol oil was used.

all round, despite the years in which the motor trades e World have been trying to achieve high speeds, one that the aircraft people have to show them the way.

C. G. G.

FLYING CLOTHING.

many years past the firm of Lewis, of Carburton t, London, W1, has been noted for flying clothing all the world.

the moment they have a plentiful supply of five guinea er coats which are well worth inspection. They can supply mask goggles fitted with genuine Triplex lenses s. 6d. clear, and 13s. 6d. tinted. Also they have a er-weight model with Triplex lenses for 7s. 6d. clear 11s. tinted.

ey also supply brown or black leather breeches and all of flying gloves, helmets, etc.

ite flying suits to put on over ordinary clothing should a special appeal to club members and private rs.—G. D.

BY ERROR.

ing to an error in transcription, the price of wooden ews for Moths was recently stated to be £3. Actually rice of the finished article as approved is considerably r than this. Our apologies to all concerned for this l mistake.—G. D.

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UE PORTS FLYING CLUB LTD.—Registered Feb. 15. Capital, £2,000 shares. Objects: To promote, assist and encourage aerial naviga- l all its forms and the study of aeronautics, etc. The minimum ubscription is 750 shares. The first directors are: Major C. F. e, Bridge House, Dymchurch, Kent. F. W. Butler, Hythe, Kent. llas Brett, Maryland, Folkestone. E. D. W. Reid, St. George's , Canterbury. Capt. L. A. R. Braddell, 32, Westbourne Gardens, tone. G. E. Took, Braymead, Kearsney, Dover. T. A. M. S. Orchard House, Postling, near Hythe, Kent. Qualification: are. Solicitors: Dallas Brett and Son, Hythe, Kent.

PERSONAL NOTICES.

DEATH.

TSON.—On Feb. 17, at Shorncliffe Military Hospital, from s received as the result of a collision in the air, Eric James , Plt. Off., No. 25 (Fighter) Sqdn., R.A.F.

Watson passed out of the R.A.F. Cadet College, Cranwell, in 1927.

FORTHCOMING MARRIAGE.

N—CRAVEN.—The engagement is announced between Mr G. Moon, R.A.F., eldest son of the Rev. Cecil and Mrs. Moon, oadwell Hill, Moreton-in-Marsh, and Sheila Mary, younger ter of the late Gerald Craven, of Belle Eau Bank, Notts, and Craven, of Coln St. Aldwyns, Glos.

MARRIAGES.

DYOTT—WRIGHT.—On Feb. 17, in New York, Flt. Cdr. George M. Dyott, late R.N.A.S., to Miss Persis Wright, of Long Island, N.Y.

[Flt. Cdr. Dyott will be remembered as a pre-War aviator and constructor at Hendon. While in the R.N.A.S. he designed and built one of the first twin-engined machines in this country. He was invalided out of the R.N.A.S., and after regaining his health he achieved distinction by his journey over the Andes and his exploration of the Upper Amazon tributaries, with a view to running an air line from the Pacific to the Amazon,—which line is now being run by American enterprise. Flt. Cdr. Dyott and his bride are spending their honeymoon searching the interior of Brazil for a missing British explorer,—Col. Fawcett.—C. G. G.]

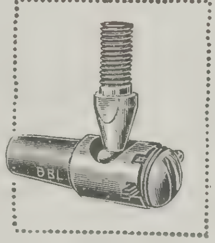
McLOUGHLIN—DORMER.—On Feb. 20, at the Oratory, Brompton, Flt. Lt. Eugene McLoughlin, eldest son of the late Mr. Eugene McLoughlin and Mrs. McLoughlin, of 10, Falkland House, Cheniston Gardens, W.8, to Ferdinande Mary (Ferdie), eldest daughter of Mr. and Mrs. John Dormer, of 40, Princes Gardens, S.W.7.

BIRTHS.

KIRBY.—On Feb. 15, at 2A, Windsor Avenue, Cliftonville, to Agnes May, wife of Flt. Lt. J. L. Kirby, R.A.F.—a son.

WEBB-BOWEN.—On Feb. 15, at 27, Welbeck Street, to Violet, wife of Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G.—a son.

YOUELL.—On Feb. 1, at 403A, Purley Way, Croydon, to Elsie, the wife of Alan B. H. Youell—a son.



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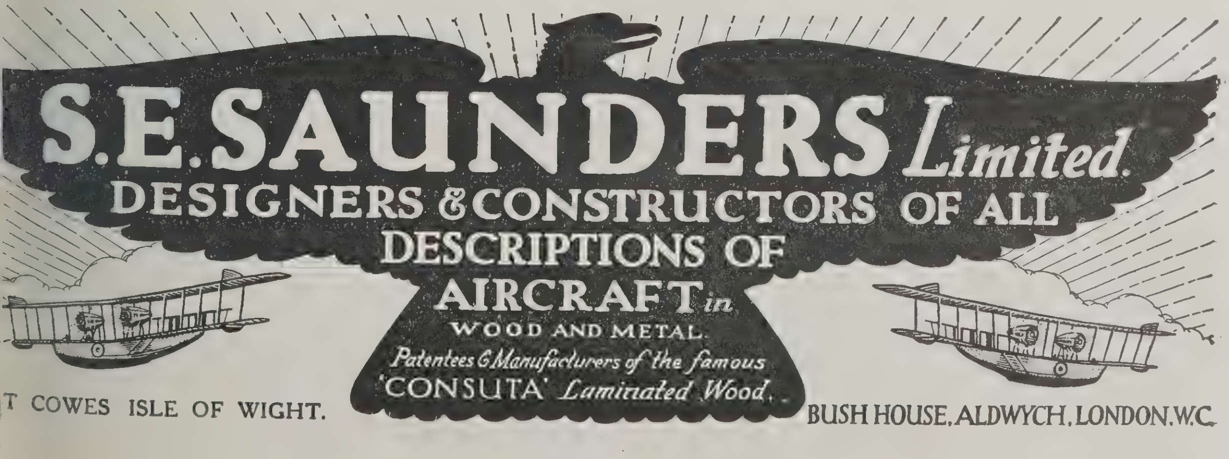

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Learn to fly at the Hampshire Aeroplane Club at a cost of £14. Write for particulars to the Secretary, at Ha Southampton.

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Vol. XXXIV. No. 9. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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MAR 4 1928
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"WITHOUT WAS NATURE'S ELEMENTAL DIN."

(Campbell.)

RAIN :—The Real Daylight Balata Co.'s Fairey IIID (Rolls-Royce Eagle) alighting through a tropical rainstorm. The line of the rain on the river in the left back-ground is curiously shown, as is the circular haze of water round the airscrew, and the throw-out of water to the wing on the left.

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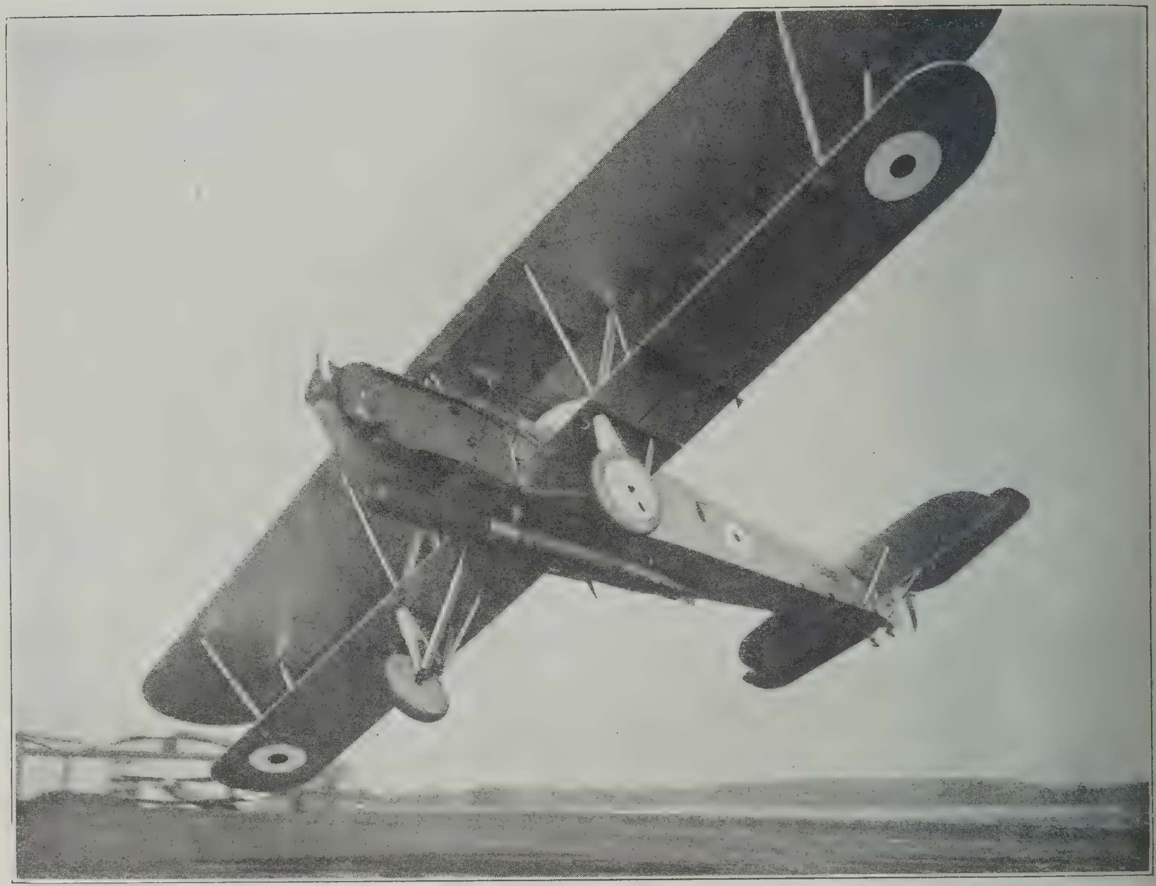

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FEB. 29, 1928.

THE AEROPLANE

Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 9.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON POWER-PLANT PROBLEMS

is being the particular week of the month in which Aeroplane lays itself out ostentatiously to be technical, e seems some excuse for setting aside temporarily the tical problems of aviation and for discussing in a lly technical way some of the questions which affect engineering side of aviation.

ne is particularly moved in this direction by the paper the repair of aero-engines which was read recently by g Commander I. G. Vaughan Fowler to a combined ting of the Royal Aeronautical Society and the Institu- of Automobile Engineers. One has no idea whether hing like a representative audience of automobile neers was present to listen to his words of wisdom. ably there was not, for, as our position in the World's kets shows, our automobile engineers (as distinct from aero-engine designers) like the Bourbons, "learn nothing forget nothing,"—or very nearly so. Still, those who there, and were capable of thinking, must have found ty of food for thought.

erely reading the condensed report of his paper which ared in The Aeroplane, has suggested certain lines of ght which, when put on paper, may perhaps suggest productive lines of thought among the more active-led men who are concerned with the design of aero-nes. And presumably, for the time being at any rate, had better be content with considering engines of ing types, that is to say with ordinary cylinders, ns, connecting rods and crankshafts.

rhaps some day somebody may produce a barrel engine swash-plate engine or some engine working on rinciple as yet unknown to us which will entirely erate all our present ideas. There are already esting experiments along those lines which promise ork some day. Only the other day one heard of an ne with cylinders arranged like the chambers of a lver, which, by some strange mechanical action, ages to turn a crankshaft through ball-jointed con-ing rods. And we know that the Fairchild Caminez ne, which works on a cam system, without crankshaft onnecting rods, works well and gives its advertised r, though one has heard that it sets up a curious vibration, probably because of the lack of direct connection between its airscrew shaft and the pistons, working as it does on cams instead of on connecting rods.

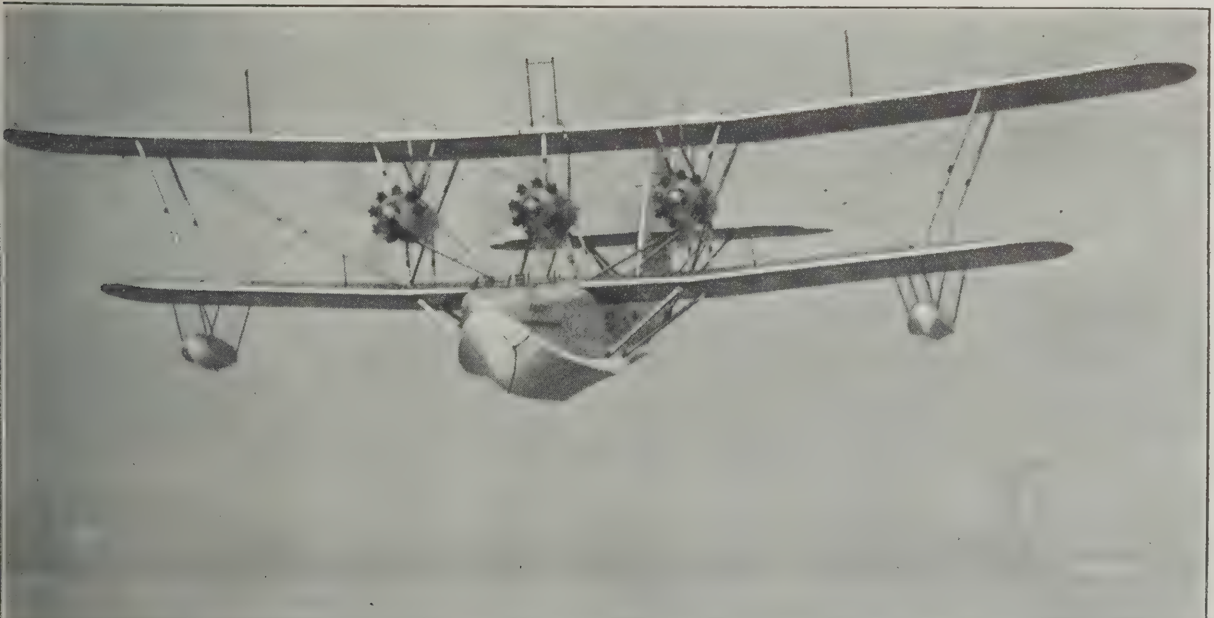
But, leaving all strange types of engines out of the question, and not even discussing the merits of the Burt cuff-valve, or of the Lanchester double-sleeve radial engine without any cylinder-walls, as against poppet-valves, there is quite a lot which might be done with ordinary four-stroke, or possibly two-stroke, engines of the types which everybody who has to do with petrol motors knows quite well.

Overhaul or Scrap?

One of the most noteworthy suggestions put forward by Wing Commander Fowler was that if we could produce an engine which had a life of 1,000 hours' running, without needing any more than top overhauls by squadron personnel, it might even pay to scrap the engine at the end of its 1,000 hours and not overhaul it at all. That 1,000 hours' running would, presumably, mean something like 100,000 miles flying, allowing that the machines in which it would be used would have a speed of over a 100 m.p.hr. and that it would spend a considerable amount of time running on the ground.

For Service machines, especially in time of war, that might be a reasonable proposition. Some months before the Armistice, the Air Ministry Production Department decided on the mass production of the A.B.C. engine, a high powered radial. That engine was far from having got through its teething troubles and had, in fact, only reached the stage at which pilots could rely on it to run for two and a half hours without breaking down. But, because of its power and lightness, those in authority considered that it was worth while to use the engines even if every engine had to be replaced at the end of a fighting patrol of 2½ hours. Alongside that a complete life of 1,000 hours would seem an eternity.

As against that, there are plenty of car engines which with a periodical overhaul and the replacement of comparatively small parts, have run considerably more than a hundred thousand miles. Therefore, one prefers Wing Commander Fowler's other alternative, which is to design



THE SHORT CALCUTTA.—The new 15-seater all-metal commercial flying-boat making its maiden flight over the Medway at Rochester.—(*"Aeroplane" photograph.*)

engines so that repairs can be made easily and quickly by squadron personnel.

Simplication.

Looking at this from the point of view of Civil Aviation, it means producing engines which can be overhauled by comparatively inexpert garage hands at aerodromes. In other words designers would have to simplify their designs. And if they would adopt the famous motto of Mr. Bill Stout of Detroit, "Simplicate and add more lightness," so much the better.

As Wing Commander Fowler said, this would mean designing components so that parts for replacement would need no fitting. In other words, that means that aero-engines ought to be designed so that any one part will fit exactly into the place for which it is intended, just as do the parts of a Ford car.

Surely at this stage of the development of the Motor Industry, we ought to be long past the day when main bearings have to be bedded down with incalculable care by men who have to be born with a talent for that particular work. After all, if a precision-tool is precise, it ought to produce parts which not only need no hand work to make them fit, but which cannot be improved by hand work.

Service Depots.

A Service Depot for the repair of aero-engines ought not to be manned by experts, it ought only to be a service depot in the same sense as those which are run in connection with mass-production motor-cars. It ought only to exist to tear engines down, as the American phrase has it, and and sling them together again with new parts out of boxes.

If the Air Ministry can get our engine manufacturers down to producing engines on these lines, we shall save hundreds of thousands of pounds, not only in the Royal Air Force, but in Civil Aviation. As things are at present, the Halton apprentices get a thoroughly good mechanical training, but they can only be trained on a limited number of types of engines and when they go out to the squadrons, the squadron workshops complain that they are not already expert engine fitters.

The fact is that there ought to be no need for expert engine-fitters in the R.A.F., any more than there ought to be any need for riggers. All that an aircraftman fitter ought to have to do is to put into place parts which already fit perfectly. And the aeroplanes themselves ought to be built so that instead of having to adjust wires and cables and turnbuckles and things, the aeroplane mechanic ought only to have to put nuts and bolts into their right places to hold struts and tubular stays of fixed length.

Such things as jigs and hand-operated tools and so forth ought to be unknown either in R.A.F. workshops or in civil aerodromes. One would not quite expect an engine to be so designed that a mechanic could take it to pieces with a monkey-wrench and put it together again by the picture on the lid of the box. There might be a need for special spanners to get at nuts or bolts which could be reached with ordinary spanners. And there might be a need for special tools to hold parts in place while spanners were being applied, or for lifting valve springs, or for holding pistons while cylinders were being replaced, or for screwing valve-ca into place. But there ought to be no such things as turnin grinding, filing or sawing.

Thirty years ago one preached this very doctrine about t cycle design and one was regarded as setting up an impo sible ideal. But it has come to pass.

What Type?

Assuming that some day we are going to have aero-engin of the higest class and of the highest power which can torn down and slung together again as easily as a Ford, t question which arises is, what type of engine is going to in the end the most successful?

At present we have a variety of types from which to choo In water-cooled engines we have practically come down the 12-cylinder V type with 6 separate cylinders a side, with two blocks of 6 cylinders each, and the 12 cylinder or "broad arrow," type, with three blocks each of cylinders. There are such things as water-cooled radials, a there are X type engines, but these are not in general u

The water-cooled in-line engine is practically dead, thou the high-powered Beardmore engines, the Cyclone and t Typhoon, which are intended to run either vertically or verted, and ultimately to use heavy oil on the Diesel pr ciple, are a revival of this type which may do well.

Up to the present, water-cooled engines have held all t speed records. Apparently, with water-cooling higher co pressions can be used, and so higher power can be got of a given petrol consumption. But against water-cooli there is always the objection of the need for water-pipes a radiators.

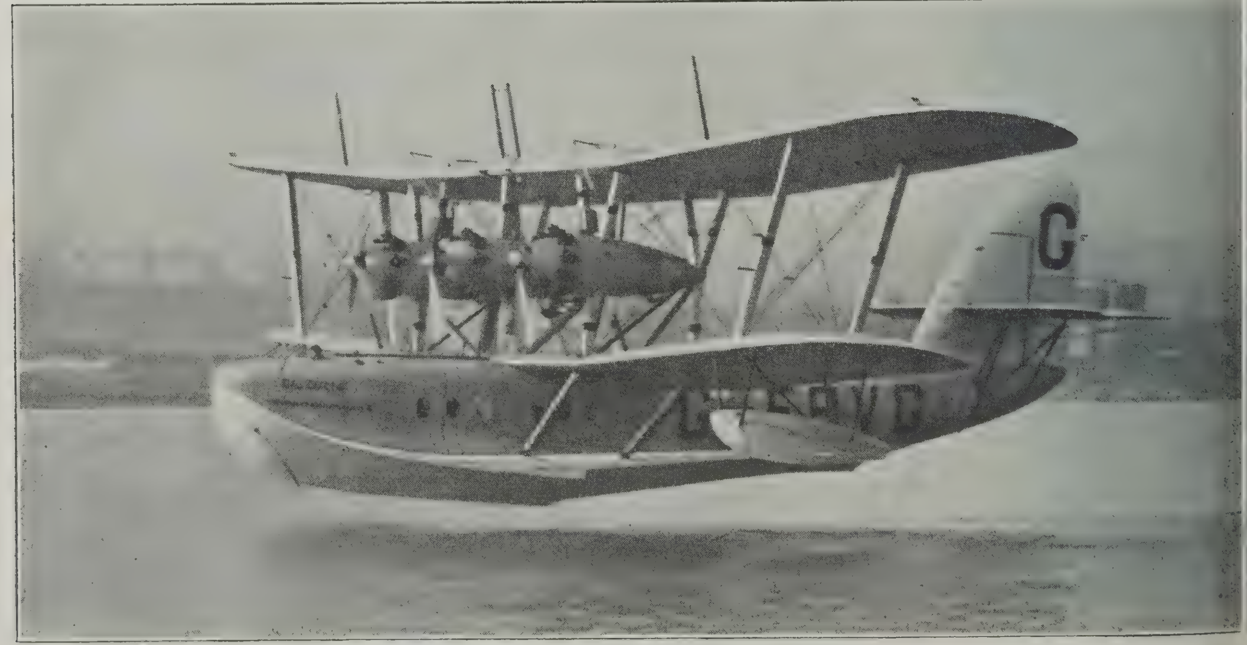
The engine maker's work may be perfect. But he is at t mercy of defective radiators and of defective fittings of wa connections,—apart from which he is subject, in this count to freakish and foolish official ideas on radiators. A for war machines, radiators and water pipes are mer so many more vital parts to be hit.

In addition there is the objection that in spite of the m skilful arrangements of radiators and shutters, water-coo engines are liable to freeze up in extreme cold and to ref to keep cool in hot climates. Furthermore, water pipe c nections, radiator fitting and so forth all mean extra w for mechanics when engines have to be taken out for o haul, and replaced.

Therefore, although for certain specific purposes wa cooled engines may survive until some entirely new form power plant is devised, there seems no doubt that bef long nobody will use water-cooled engines for either gen purposes in war or for Civil air transport.

Air-Cooled Radials.

Assuming then that air-cooled engines are going to be u for almost all aircraft, what is going to be the next devel ment in aero-engine design? Certainly the greatest succ at any rate in high powers, of late years, has been am the radial engines. The Bristol Jupiter, the Armstro Siddeley Jaguar, the Wright Cyclone and the Pratt Whitney Wasp, all about the same weight and power, h done good work and have given very little trouble.



A SUCCESSFUL DEBUT.—**The Short Calcutta (three 485 h.p. Bristol Jupiter IX engines) about to alight in the Medway after its maiden flight.**—(*"Aeroplane" photograph.*)

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4. LONGEST SOLO FLIGHT ever made.
5. FASTEST TIME ENGLAND TO INDIA.
6. FIRST NON-STOP FLIGHT, LONDON TO ROME.

The flight is a great triumph for a British machine and pilot, proving once again the Avian's superiority.

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Jupiter in particular is probably the most widely used engine in the World and is certainly built under licence in more countries than is any other one type of engine.

All these engines have turned out to be very reliable and give enormous power for their weight. Undoubtedly for certain purposes, on machines with a moderate top speed, they have proved superior to water-cooled engines of similar power when loaded up with radiators, and so forth. But there is no getting away from the fact that when really high speeds are wanted, that is to say, from 200 miles an hour upwards, the big star-fish engine is at a disadvantage.

Various firms in various countries have tried to build pursuit ships with radial engines. But such machines have always been slower than machines of smaller power with water-cooled engines.

So far as this country is concerned, the technical people at the Air Ministry console themselves with the idea that, because of their lightness, machines with radial engines can out-climb machines with water-cooled engines. But there seems to be very little advantage in pushing a machine up to 30,000 feet or so, and calling it an "intercepter fighter," when in diving onto its water-cooled enemy its limiting speed in the dive is about equal to the top speed of the other machine when flying level.

In spite of the best efforts in the way of cowling radial engines no designer has yet produced an aeroplane with a radial which is as fast as a well streamlined machine with a water-cooled engine.

Building a fuselage out to the diameter of a big radial, to get what looks like a proper streamline, does not pay. The American method of putting a small fuselage behind a circle of projecting cylinders is better. But even that cannot compete with a water-cooled engine of small frontal area built into a small fuselage.

For civil work the light and powerful radial engine has distinct advantages. This has been thoroughly proved by the high-speed long-distance flights made by foreign machines with Jupiter engines in the high-power class, and by De Havilland machines with the Jaguar engine, and by foreign machines with the Wright Whirlwind engine in the 200 h.p. class, as well as by three-engined machines, some with the Whirlwind and some with the Lynx.

For some commercial work where perhaps speed may not be the most important consideration the radial engine without cowling has immense advantages. Any ordinary motorbicycle mechanic can change plugs and adjust valves, and so forth. And everything is immediately get-at-able.

Streamlining.

But we are getting to the stage where speed is as important in civil aeroplanes as in war machines. And properly streamlined noses on civil aircraft are becoming very important.

The high performances of Moths and Avians and Widgeons with Cirrus engines show the benefit of such streamlining even at low speeds, round about 100 miles an hour. And the De Havilland engine in the Tiger-Moth, with its 200 m.p.h., gives some idea of what can be done by carefully streamlining an "in-line" engine. But the in-line engine, and still more the V air-cooled engine, which can be produced by putting two rows of the in-line engine on one crankcase, has the disadvantage of sticking up in front of the pilot and obstructing the view. Which objection also applies to the top cylinders of a radial.

Another fact which tells against radial engines of all sorts is that the insurance companies raise their premiums quite considerably on any machine fitted with a radial engine, because in a comparatively simple crash, such as is caused by a bad landing in which the undercarriage is wiped off and the machine alights on the bottom of the fuselage, a radial engine, whether large or small, has a nasty habit of wiping off its lower cylinders, or, at any rate, of removing their valve-gear.

The Inverted V Type.

The line of development which seems most likely to pay, provided that the same power can be got out of it as out of other engines of similar weight and size, is the inverted V air-cooled. This is a type with which practically nothing has been done in this country, though one believes that a little experimental work has been done with it at the Royal Aircraft Establishment at Farnborough.

In the States experiments with this type have been going on for a long time. Mr. Heron, formerly of the Royal Aircraft Factory at Farnborough, then of McCook Field, later of the Wright Aeronautical Corporation, and now a detonation expert with one of the oil firms, was persuading an inverted Liberty with air-cooled cylinders to run on the bench at McCook Field in 1924.

Since then the inverted Liberty engine, water-cooled, has been used with remarkable success by the Loening Brothers in their amphibian flying-boats, a number of which made a voyage without trouble all round South America, much to the good of the prestige of American aviation. And, one believes, a good deal of further development work has sinc been done with the inverted air-cooled Liberty.

Certainly the inverted air-cooled V type engine has in mense advantages. It can be more easily streamlined tha any other type of engine in the World, except perhaps a inverted in-line engine. The crankcase lines in perfectl with a flat-topped fuselage—which is the only type fro which really high speeds can be got (although many of ou leading aircraft designers do not seem to have grasped th fact, and still seem to think that the fuselage which is be in a wind-tunnel is also best in an aeroplane).

The projection outwards of the cylinders coincides almo exactly with the pilot's view downwards on either side Louvres and shutters to regulate the flow of air for coolin are easily arranged in the cowling. And the cylinder-head can be protected against the effects of bad landings by prolongations of the lower longitudinal members of the fuse age, without in any way interfering with getting at th cylinders to tinker with plugs or valves.

An engine of that type, embodying all the improvement and all the knowledge of material and detail design whic have been learned by the builders of radial engines, suc as the Bristol, Armstrong-Siddeley, Wright, and Pratt an Whitney firms, ought surely to combine most of the advan tages of the radial and the water-cooled types. The lon crankshaft might prevent it from getting quite down to th lightness of the radial, but it would have the reduced hea resistance of the water-cooled types, plus the advantage not having any radiators to add to its head-resistance an weight, and so it would score in performance over the radia

Airscrew Efficiency.

There is another point in connection with power-plant which is well worth considering. So long as we stick to th single-engined tractor biplane with a direct-driven airscre we are bound to go on losing an enormous proportion our power because in all machines the effective blade-are of the screw is so largely taken up by the frontal area the engine and fuselage behind it.

Some of the big radial engines on high-speed machine blanket more than half their own airscrews. And even a machine happens to have a water-cooled engine which do not itself blanket the airscrew except where the cylinde stick up, a deep fuselage behind the engine must ha very nearly as bad an effect. In such a machine the sli stream from the screw has to be deflected to get round th fuselage and that must waste an enormous amount of powe

The amazingly high speeds reached by the De Havillar Hound and the Fairey III.F which were entered f the General Purpose Competition of the R.A.F. (spee somewhere in the direction of 180 m.p.h., for fully equippe two-seater war machines, and, at that, biplanes with stru and bracing wires) were certainly largely due to the fa that they had Napier engines with special low gearin which, although it did allow the engines to run a bit fast and so got a trifle more power out of them, had the still mo important effect of allowing the use of airscrews of ve big diameter which had most of their blade area well outsi the obstruction of the engines and the fuselage.

Since then a number of machines have been produced wi the new mark of Jupiter engine in which is embodied t Farman type of bevelled epicyclic gearing which allows t use on a radial engine of a much bigger airscrew. The i provement in the performance of the machines so fitted quite as marked as with the specially-geared Napiers.

Probably some of the improvement is due to the fact th a big airscrew running comparatively slowly is more efficie aerodynamically than a small high-speed airscrew. But is fairly sure that the greater part of the improvement due to the big proportion of the blade which is free fr obstruction behind it.

Big Fuselages and Airscrews

This is a question which is particularly of interest to signers of commercial machines in the 200 h.p. 4-5-seat class. Machines of this type must have fat fuselages give room for the passengers and if these great big fuselag are stuck behind comparatively small engines with c respondingly small airscrews, the screws are bound to be efficient.

There would be much interest in seeing what the res would be if a machine were built very much on the lines the popular American monoplanes, all of which have a spe of somewhere about 120 to 130 m.p.h., and if it were fitt with say a Lynx or a Whirlwind engine geared down take a big airscrew as is being done with the new Jupite One fancies there would be a remarkable improvement in performance all round.

Pushers for Power.

This question of gearing suggests the further conside tion of what improvement could be got by using pusher

England—Australia in 15½ days!

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A few of the 1927 achievments by aircraft fitted with Fairey Metal Airscrews:

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screws instead of tractors. Apparently an airscrew does not mind very much what sort of air it collects to do its work, so long as it can have a clear run-off for the air after it has done with it. That is to say if one built power-units, say for a flying-boat or a big twin-engined land machine, with the engines in front and the oil tanks and things behind, more or less streamlined down to airscrew bosses at the tails of the said units, the screws would collect quite happily the streamlines which had been broken up by struts and stays and wires and straighten them out into highly efficient slipstreams behind.

Purely as a suggestion, one would submit to those who have money to spend on experiments, which in effect means only the Air Ministry in this country, there might be useful knowledge to be got by building a couple of power-units of this sort and putting them into a machine whose performance is already known.

There is admittedly a certain amount of difficulty about transmitting power through a long, straight shaft to an airscrew. And there is the weight of the shaft itself as an objection. But surely the weight of such a shaft should not be greater than the weight of gearing and a gearcase. And the difficulty of fixing it satisfactorily ought not to be greater.

Perhaps the experiment might prove that as a pusher an ungeared airscrew is just as satisfactory as a big geared screw. And, for the matter of that, if it did not, the experiment might be extended to driving from the engine direct to a gear-box fitted in the tail of the power-unit.

Apart from getting higher efficiency out of the airscrew, the use of pusher screws in this particular way would do away with the battering of the slip-stream on struts and wings, and other obstructions, which is, in fact, the cause of most of the noise in passenger machines.

A radial engine built into a streamlined power-unit would certainly make a very nice symmetrical job. And if the inverted V type air-cooled engine should turn out to be popular thing for the single-engined tractor aeroplane, t type of power-unit for multiple-engined machines mi very well prove to be the salvation of the radial type engi or, at any rate, a very useful way of using up the ty when it is no longer wanted for tractor machines.

Also, experiments are needed to prove whether a f double-opposed engine, with six or eight cylinders a-si such as was shown at the last Paris Aero-Show, has great advantages when built into the wing of a twin-engi machine—and used either with a pusher or a tractor scr

Then there is need for experiments in gearing fron central power-plant in the fuselage (or hull) to screws the wings. One engineer suggested, years ago, gearing at the engine and running a small flexible shaft at perh 10,000 r.p.m., or more, to gear down again at the airscr boss.

Which again suggests the need for experiments with screws the tips of which run beyond the speed of soun thus involving entirely new ideas of blade-sections for screws. If something of the sort can be done we may co to very small and very light screws running at thousa of r.p.m., a number of them being used along the trail edge of each wing.

If one were a millionaire, like some of the Councillors the Royal Aero Club, one would like to try some of th experiments. But as one is not, there remains only the Ministry, where fortunately we have a singularly enlig ened and progressive team of Chiefs of Departments on Technical side. One of the old R.N. ratings at Eastchu used to say as an excuse for extravagance, "Ah! We the Navy's a big firm, sir." The Air Ministry is not so as all that, but it can afford to experiment a bit. So hopes it will solve some of our power-plant problems bef the present Technical Team pass on in due course to th next posts.—C. G. G.

THAT FIRST FLYING MACHINE AGAIN.

The inherent respect which the essential Englishman always seems to feel for anything in the way of an Old Master appears to extend to Aviation. In a way it is an excellent attitude of mind, for it shows that proper spirit of respect which is really the basis of discipline. Therefore, although this reverence for genuine antiques *can* be overdone, one is pleased to be able to publish a letter from one of the earliest pioneers of British Aviation who has happily, unlike so many Old Masters, continued in the forefront of progress. Mr. Handley Page, whose own aeronautical experiences go back to at least the year 1908, writes as follows :—

> Sir,—I was considerably astonished to read the contents of your article entitled "That First Flying Machine" in your issue of Feb. 22.
>
> You are evidently unaware of the great contribution to the science of Aeronautics which the Wright Brothers made.
>
> If you examine the proposals made by any aircraft experimenter, or if you examine the designs of any aircraft constructor, prior to the date of the Wright Brothers' first machine, you will find that the essential feature of control is lacking. The Wrights discovered that to obtain lateral control it was necessary to warp the wing tips in opposite directions, and that this warping device produced not only a difference in lift and therefore the requisite rolling moment, but unfortunately also produced a difference in resistance causing a yawing moment which had to be balanced by the rudder.
>
> If my recollection serves me aright the earliest Wright machine was not provided with the rudder and it was only a result of their early gliding experiments that the provision of this control was found to be necessary, particularly the necessity for its simultaneous use when the warp was used.
>
> Before the Wright Brothers were able successfully to achieve power-driven flight they had not only carried out the wide range of glider experiments that are well known, but also a considerable amount of wind-channel research-work, the models of which I was privileged to see at Dayton when visiting Orville Wright in 1921.
>
> On the other hand if you will refer to the early work done by Maxim, Horatio Phillips, Lilienthal, Pilcher, Langley, you will find that no provision was made for this essential feature of control. Similarly if you refer to other designs of that date you will find that the provision of ailerons or warp for use at the same time as the rudder was unknown until the Wright Brothers demonstrated the necessity for this simultaneous use.
>
> I have set out the above facts as I am sure that they have only to be brought to your notice for you to give that adequate apology which is evidently due. (Signed) F. HANDLEY PAGE.

In reply one would say that one has at one time or another read pretty nearly everything that has been printed in connection with the contributions of the Wright Brothers to Aviation, and, in consequence, one is a little doubtful about the use of the word "science" in connection with their work.

Science strictly means knowledge,—of which there is little enough in aeronautics even to-day. The Wright Brothers' science, or knowledge, of aeronautics, as derived from the experiments to which Mr. Handley Page refers, seems to have been limited to the fact that a cambered aerofoil is better than a flat one. Sir George Cayley seems to have this knowledge somewhere in the year 1803 or thereabo at least 100 years before the Wrights. And the Wrights th selves acquired a great deal of their knowledge in this spect from the work of the late Octave Chanute and c temporary experimenters such as Lilienthal, Pilcher, Ma and Phillips.

When one writes of aeronautical science, so far as existed in the early days of the Wrights and Langleys, finds Mr. Handley Page's letter a valuable addition to arguments in favour of Langley's superior knowledge aerodynamics.

The Langley machine had at any rate a thoroughly ef tive rudder, and it also had considerable provision of lat stability,—in that its wings had a large dihedral angle. result was, that after it was strengthened it was capable flying in its original aerodynamic form. But, according Mr. Handley Page, and one believes he is quite correct his statements, the Wrights, not knowing enough about science of aeronautics to provide lateral stability by usin dihedral angle, discovered that to obtain lateral contro was necessary to warp the wing-tips in opposite directi Then they discovered that the trailing edge which was pu downward caused a yawing moment. And only after did they discover that such a thing as a rudder was ne sary

So, when one considers that the Wrights knew so li that they made no provision either for the lateral stabi or the directional control of their machine, it seems aln ridiculous to hold them up as contributors to the science aeronautics when Langley had already proved his supe science by providing precisely such aerodynamic qualitie

Control by warping the wings, in the manner of Wrights, was very soon abandoned as dangerous, so even in this matter the Wrights have not contributed thing to the modern aeroplane. For the matter of tha well-designed and inherently stable aeroplane of to-day be flown quite conveniently without using the ailerons, machine being controlled by rudder and elevator alone. one would not be at all surprised if in the near future aile themselves should be abolished, as a clumsy and ineffic fitting, such lateral control as is necessary in landing getting off being got entirely by operating Handley P Slots on the leading edge. In that case the very last of Wright Brothers' alleged contributions to the science aeronautics will have vanished.

Everyone has due respect for Mr. Orville Wright sonally as the first man who was ever catapulted off ground in an aeroplane. And in this connection there w be interest in discovering who was the first man to fly aeroplane off the ground under its own power. Leaving the small hops of Santos Dumont in France, and of F hammer, the Dane, as not being fully-controlled flights, fancies that the real hero would be the first person to

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From All Parts of the World

CANADA "They have been subject to hazardous work and weather conditions. Their performance throughout has fully justified the expectations of your Company."
"It is futile to dilate further on the qualities of the Moth because whatever I say lacks the renown to which they are entitled."

PORTUGAL "Last hop, Biarritz Tancos, four hours, fifty minutes, average one hundred miles an hour, congratulate you wonderful machine compliments writing."

SPAIN "All three pilots were most enthusiastic about the performance of the Moth."

SOUTH AFRICA "Machine behaved splendidly throughout flight no adjustment whatsoever despite intense heat."

KENYA "It is unusually easy to handle in the air and is extremely light on controls, and therefore not in the least tiring to fly and has a very good all-round performance, landing even at an altitude of 6,000 feet was extremely easy."

SWEDEN "They expressed their great satisfaction with the splendid performance of the Moth, and declared that they had never flown a better Machine."

U.S.A. "I have been flying different machines since the aviation meet in Los Angeles since 1911 and can truthfully say that for pleasure flying I have never had anything to equal the Moth . . . . I had quite a number of pilots fly it and every one without exception claimed that it was the nicest flying aeroplane they had ever flown."

RHODESIA "To put it mildly, I will say that your machine was really a little marvel. She just whizzes along in all kinds of weather without a quiver and we feel absolute confidence in her . . . There are no proper landing-grounds and the poor little beggar has to take up in the air over very rough and boggy ground, in . . . she had to take up from the street."

DE HAVILLAND AIRCRAFT CO., LTD.,
STAG LANE AERODROME, EDGWARE, MIDDLESEX.

Telegrams : Havilland, Phone, Colindale.
Telephone : Colindale 6160.

the first machine built by the syndicate composed of Dr. Graham Bell and Messrs. Curtiss, McCurdy and Baldwin.

To claim that the Wright Brothers contributed materially to aeronautical science is as if one claimed that the real pioneer of the science of automobile design was the first gentleman who pegged a couple of planks together, chopped them roughly into a circle, stuck a stick through the middle and so produced the first wheel. And even that is not a fair analogy, for Langley had a working knowledge of aerodynamics, which the Wrights evidently lacked.—C. G. G.

MAJOR-GENERAL E. B. ASHMORE.

It was announced on Mar. 24 that Major-General E. B. Ashmore, C.B., C.M.G., M.V.O., General Officer Commanding Territorial Army Air Defence Formations, will relinquish his appointment on Mar. 1 and will be succeeded by Major-General C. A. Ker, C.B., C.M.G., C.B.E., D.S.O.

Major-General Ashmore, who was born in 1872, was posted to the Royal Artillery in 1891. He served in South Africa with an R.H.A. battery and was severely wounded at Sanna's Post. He went to the General Staff in 1908 and in 1913 became A.M.S. to Sir Ian Hamilton, the G.O.C. in C., Mediterranean, and Inspector-General, Oversea Forces. He had already learned to fly and was on the R.F.C. Reserve, but it was not until 1915 that he served with the air arm in war. He was a Brigade Commander, R.F.C., for eleven months in 1916 and in 1917 became B.G., R.A.

In the early summer of that year the British public was much disturbed by enemy air raids and was not greatly satisfied with the measures taken for their protection though they were the best that means permitted. Thus the Government decided to make drastic changes and in July General Ashmore was appointed to command the London Air Defence Area, a military command directly under G.H.Q., Home Forces. He was given the means and his own personal energy supplied the organisation and vitalised the command. In a short space of time he reorganised the defences and brought together into a composite whole the guns, searchlights, sound indicators, aeroplane patrols and balloon aprons (his own device). The effect was felt at an early date. The September raids made by the Germans were not encouraging to the enemy and by degrees the enemy air menace faded. The Zeppelins were the first to be defeated followed closely by the aeroplanes. The raid of the 19th/20th May, 1918, was the last of any importance as the raiding squadrons suffered too heavily for their happiness or their sense of proper action in war. By the end of the war the finest anti-aircraft defence organisation the world has known was in existence and General Ashmore's staff had only one regret, that the enemy could not be induced to give it a fair test.

After the war, in the general desire for economy, the air defences were reduced to cadre strength. General Ashmo was appointed to the command of the Regular Air Defen Brigade at Aldershot, an appointment which he held un Mar. 1, 1924, when the R.A.F. became responsible for t Air Defence of Great Britain. He was then given the a pointment which he now relinquishes at the end of his fi years' term. In the four years he has done much good wo in building up an organisation with insufficient materi His successor's task may be simpler but its simplicity w in the main be due to the work of General Ashmore.

W. E. DE B.

WHAT PRICE GLORY?

On Feb. 11 M. Costes and M. Le Brix arrived at Mitch Field, L.I., N.Y., on their Breguet XIX biplane (500 h. Hispano-Suiza engine), thus completing a 25,000-mile flig from Paris by way of West Africa, South and Central Americ

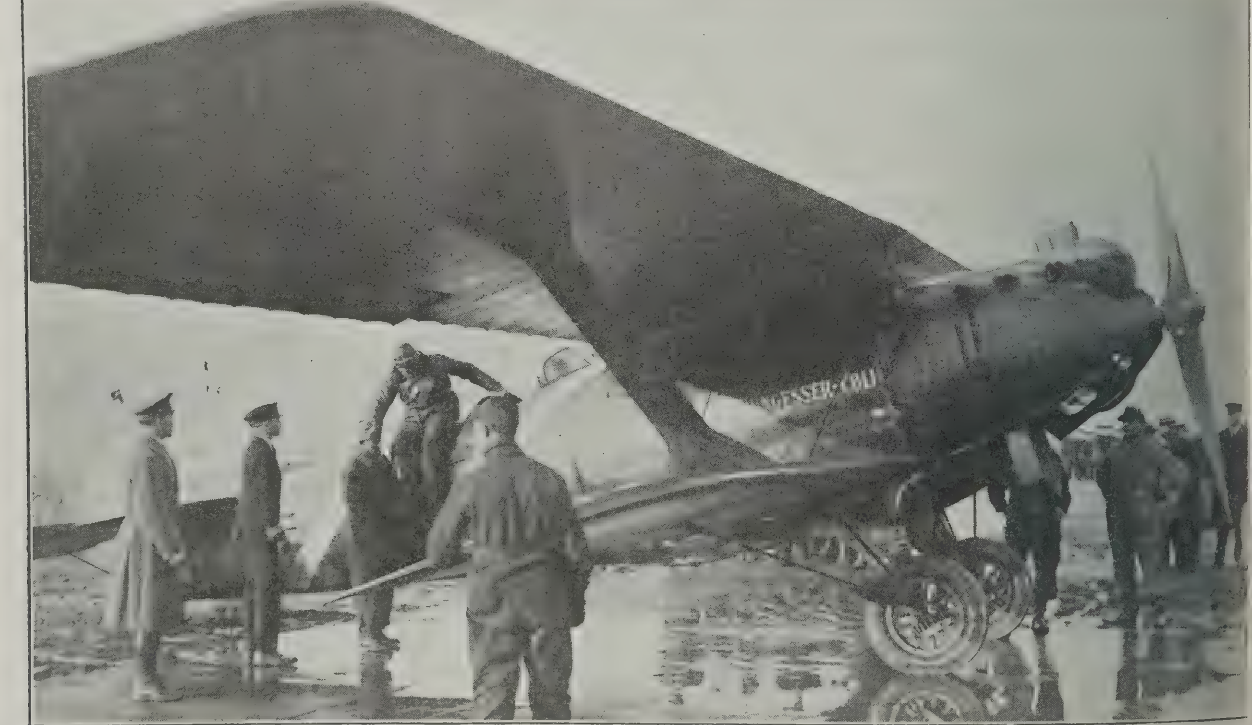
They were met by the French Consul-General, the Co manding Officer of Mitchell Field, a representative of t Mayor of New York and a number of aviators.

On Feb. 13 they were guests of the Ancient and Secr Order of the Quiet Birdmen in Greenwich Village.

On Feb. 14 they were officially welcomed by the Mayor a Board of Aldermen of New York at the City Hall.

From the above it would seem that their reception in Ne York was hardly what might have been expected, but t following explanation by the New York correspondent *The Observer* is interesting and throws a light on the eni matic mentality of the inhabitants of a great city that skilful publicity and stage management can be made to " wild " to order.

> Hero-worship, like many other things, most other things, or us say, nearly everything, is standardised here. The two Fren flyers, Costes and Le Brix, found it so when they arrived h recently as the first men to fly the Atlantic from East to West. is true they had arrived in South America and had called in Wa ington before flying to New York, but their visit was regarded as some way a return of the call Lindbergh paid in Paris. The offic Fifth Avenue parade consisted of five motors, and was more th adequately protected by two motor-cycle policemen. It raised single cheer within my hearing as it passed "the busiest corner the world," and the official reception at the City Hall was form though very polite. Americans themselves are muttering at a l of graciousness in the populace of the biggest city in the unive The trouble is that New York, like all American colleges and scho has a "cheering section." It works in lower Broadway, and expects its heroes to come up from the Battery, arriving by sea starting about half an hour before lunch. In those circumstances will shout itself wild and throw the employer's paper and teleph books (the latter mercifully torn up) out of the skyscraper windo and then go out early for lunch. On those terms heroes can h a good reception, but heroes who arrive at a neighbouring fly field and start their parade from an hotel after lunch must be c tent with the mild indifference accorded the two French flyers.



THE END OF A GREAT FLIGHT.—The arrival at Bolling Field, Washington, D.C., of M. Costes and M. Le Brix on their Breguet XIX (500 h.p. Hispano-Suiza engine) after having flown from Paris by way of West Africa, the South Atlantic, and South and Central America, a total distance of 25,000 miles.

BY APPOINTMENT
TO HIS MAJESTY THE KING

Mr. Bert Hinkler
put his trust in
Wakefield Castrol

Flying his "Cirrus" Engined Avro "Avian" Light Aeroplane, Mr. Hinkler left Croydon on February 7th, and reached Australia, a distance of approximately 12,000 miles, at 6 a.m. February 22nd. En route Mr. Hinkler cabled from Singapore: "ENGINE RUNNING PERFECTLY ON YOUR CASTROL R."

This amazing flight handsomely breaks all previous records for an Australian flight, and also for the longest flight unaccompanied; while on the first day of the flight Mr. Hinkler reached Rome from Croydon, 1,100 miles, in 13 hours 57 minutes, thus breaking (subject to homologation) World's Light Aeroplane Records for distance and duration.

Naturally, Mr. Hinkler took no chances, and following precedent set in so many great flights, insisted on—

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Castrol Regd.
MOTOR OIL

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MEXICAN MILITARY AVIATION.

Aviation, both Military and Civil, in Mexico is controlled by a special Government Department (El Departimento Aeronáutico). This Department of Aeronautics has at its head at present Brigadier-General of Engineers Pedro Caloca, with Col. Samuel C. Rojas as assistant.

Under this central directorate the department is divided into sub-departments responsible for the control of :—(1) Accounts, (2) the purchase of material, (3) Military operations, (4) Mapping, laying out and control of aerial routes and landing grounds, (5) Government Aeronautical Workshops, (6) the School of Military Aeronautics, (7) the Squadrons of the Military Air Service, and (8) a publicity department which, *inter alia,* publishes the journal *Revista Aérea,* whence the description of the organisation is drawn, and acts as a propagandist agency on behalf of Mexican Aeronautics.

The Mexican National Air Force (Fuerza Aérea Nacional) is directly under the command of the head of the Department of Aeronautics.

All purely military and sub-departments are directly under the orders of the Chief of the Department of Aeronautics, but it seems to be suggested that sub-department (4) dealing with mapping and aerial routes, and sub-department (9) dealing with propaganda have a certain quasi-independence.

The sub-department dealing with mapping and aerial routes also serves in some sense as the "Technical Department" of this organisation, for it is said to have on its staff engineers whose duty it is to report to the chief of the whole organisation on the merits of all new inventions and designs submitted by the Aircraft Industry.

The Government workshops (Talleres Nacionales de Construcciones Aeronàuticas) at Valbuena, near Mexico City, have Sr. Enrique Paulman as director in chief, who has below him a chief engineer, a chief stores officer and an accountant and costs officer.

The function of these workshops includes the design and construction of aircraft and engines for the National Air Force, and the repair and overhaul of all service equipment.

The Military Aeronautical Park, also at Valbuena, is the headquarters of the whole Air Force. It is divided into three sections—Staff, Squadrons, and Flying School. The whole organisation is under the command of Major Rafael Montero, with Major Alvaro Jiminez as his chief of staff.

Each squadron is commanded by a major and consists of five officer pilots. Officers under instruction at the School of Military Aeronautics may be attached to these squadrons as part of their training.

This school of Military Aeronautics undertakes the whole training of officers for the Air Force and is not merely a flying school. Its pupils are apparently drawn from among applicants from the Mexican Army, and are subjected to careful medical as well as other examinations before they are accepted for service in the Air Force.

The course of instruction covers air strategy and tactics, co-operation with the Army, together with the more purely technical aspects of air operations. It is not quite clear whether the actual flying school is a distinct entity, or is a branch of this general training establishment.

The department concerned with aerial routes has now produced special maps covering 79 air routes in Mexico, and has been responsible for the installation of organised aerodromes at Mexico City, Pachuca, Guadalajara, Monterrey, Tampico, Torreon and Enpalme. Sites for twenty-nine other aerodromes have been selected and these are to be equipped for use in the near future.

THE ILL-FATED FLIGHT TO NEW ZEALAND.

The loss of Capt. Hood and Mr. Moncrieff in a singularly ill-organised attempt to fly from Australia to New Zealand on Jan. 10 ought to have some salutary effect in preventing any further such attempts with unsuitable machines which depend entirely on their engines for their safety. Admittedly the Wright Whirlwind engine is one of the most reliable in the World, but the best of engines stop for unknown reasons, so such flights are a gamble with death and nothing else.

Well-informed information from Australia discloses a number of interesting points about this flight. In the first place the Department of Civil Aviation and the Royal Australian Air Force reported to the Prime Minister, Mr. Bruce, that in their opinion the flight was not well-equipped and Mr. Bruce officially expressed his disapproval of the flight. On the other hand, Mr. Coates, the Prime Minister of New Zealand, who evidently has not Mr. Bruce's knowledge of aviation, seems to have given at any rate his personal encouragement.

The only long flight the machine had ever done prior to starting for New Zealand was from Point Cook to the Richmond Aerodrome, Sydney, a total distance of 550 miles, with one intermediate stop. Neither of the aviators had any knowledge of navigation. No navigation lights were carr on the machine and no signal lights or Very lights w carried. The collapsible lifeboat was stored under the pil seat, where it would be very difficult to extricate if machine came down on the water, and was of a type wh would take a long time to blow up.

Under the circumstances the flight could only have s ceeded through extraordinarily good luck in hitting N Zealand on a compass course, even if nothing had happe to the engine or the machine.

THE HANDLEY PAGE SLOT IN SWEDEN.

According to *The Times,* the Swedish Air Board has as the Government to allot a sum of Kr.388,700 (about £21, for the equipment of aircraft with the Handley Page slot the prevention of stalling and spinning.

When Mr. Handley Page visited Stockholm during recent Air Conference, called by the Institute of Engin ing, the Swedish authorities approached him in regard to use of his patent automatic slot in the aeroplanes of Swedish Air Force. Mr. Handley Page then offered to is a licence to the Swedish Government for the manufac and use of his invention, and the Air Board is anxious an agreement should be made without delay.

The terms suggested by Mr. Handley Page are that should receive £5,000 in cash and a royalty of 5 per cent. the value of each aeroplane—exclusive of engine, ins ments, and military equipment—fitted with the invent The royalty would cease after Mr. Handley Page had ceived a total sum of £25,000; thereafter the patent may used without further payment.

THE COMING OF ALL-METAL AEROPLANES.

In accordance with the declared policy of the Air Minis steady, though necessarily slow, progress is being made w the re-equipment of the Royal Air Force with all-metal craft.

Within a few days the Fairey Aviation Co. Ltd. will h delivered the first of a batch of Fairey III.F machines which all woodwork in the fuselage structure has been placed by metal. A week or two later the same firm begin to deliver machines of the same type with all-m wing structures as well as all-metal fuselages.

No details of the precise construction of these machi can as yet be published. It may however be said that components of either metal or wooden construction for th III.F machines are interchangeable. That is to say t metal wings are interchangeable with wooden wings, metal fuselages with wooden fuselages.

A NEW FAIRCHILD CAMERA.

The Aerial Camera Division of the Fairchild Ae Corporation, of Farmingdale, L.I., N.Y., have just produ a new camera of the multiple-lens type designed for ae survey work.

This camera takes four simultaneous photographs at e exposure. One of these is vertical, a second is taken slig obliquely either forward or behind the vertical one and other two photographs are one on each side of the vert photograph.

After development these films are printed through a tr forming camera which automatically reproduces the obli photograph to a scale corresponding to that of the vert photograph. That is to say, the distortion due to obliquity of the lens axis is corrected in the prin process.

The camera carries in its magazine 680 ft. of 6 in. film, and will cover a strip of territory 9 miles wide by miles long on the one film from 15,000 ft. with an ove of 60%.

Tests of this new camera, known as the Fairchild A gram, made by the U.S. authorities are reported to been satisfactory, and the United States Air Corps have pla orders with the Fairchild Camera Co. for twenty comp sets.

A BOMB CLAIM.

On Feb. 27 the Royal Commission on Awards to Inven at the Law Courts heard the claim of Mr. F. Marten H against the Government in respect of inventions of ae bombs and rifle grenades.

Lieut.-Col. Finch Noyes, formerly of the Royal Air Fo described trials in 1915 to test the efficiency of aerial bor About 60 or 70, he said, were dropped, and of these th failed to explode. Four bombs could not be accounted and it was assumed that these also had not exploded.

Sir Duncan Kerby, for the applicant, suggested that it a case where the Crown should pay a substantial royalty view of the fact that alternative devices had either turned down or were impracticable.

The inquiry was concluded.

Chosen for Staff Duties by the R.A.F.

WE are gratified, naturally, at having received from the Royal Air Force an order for a large fleet of 15·9 h.p. Morris-Oxfords for Staff duties.

In their choice of these Morris cars, the Air Force, whose technical knowledge of motoring matters is undoubtedly greater than that of any other arm of the Services, were guided by the well proven efficiency, economy and reliability of this model.

But more than that:
For Staff duties they looked for a car to be in keeping with the dignity of those who would use them; to provide more than ordinary comfort and to be a credit in appearance to the Service that they represented.

All these qualities they found in the 15·9 h.p. Morris-Oxford—and in their choice not only spent tax-payers' money as wisely and as economically as it could be spent, but give, as well, a lead to those tax-payers who would obtain the maximum return for their own personal motoring expenditure.

Write, mentioning the "Aeroplane," for Free Booklets:
"Motor Driving Self Taught,"
"Motoring at Minimum Cost."

Models & Prices

11.9 h.p. MORRIS-COWLEY	
2-Seater. With rear brakes and simple equipment	£ 142 10s.
All the undermentioned models have Four-wheel brakes, full equipment and are supplied in various distinctive colours.	
2-Seater	£ 152 10s.
4-Seater Tourer, 4-Door	£ 170 0s.
¾-Coupé, Fixed Head	£ 175 0s.
Saloon (2-Door) ...	£ 177 10s.
,, (4-Door) ...	£ 185 0s.
11.9 h.p. MORRIS-OXFORD	
Tourer, 4-Door ...	£ 205 0s.
Saloon, 4-Door ...	£ 215 0s.
14/28 h.p. MORRIS-OXFORD	
2-Seater	£ 210 0s.
Tourer, 4-Door ...	£ 225 0s.
¾-Coupé (Drop Head)	£ 230 0s.
Saloon, 4-Door ...	£ 250 0s.
Saloon Landaulet ...	£ 285 0s.
15.9 h.p. MORRIS-OXFORD	
5-Seater Tourer ...	£ 315 0s.
Saloon, 4-Door ...	£ 345 0s.
11.9 h.p. Morris-Cowley Traveller's Car ...	£ 167 10s.
Half - Ton Van. A new model. 75 cubic feet body space ...	£ 165 0s.

All prices ex Works, Cowley.

MORRIS

MORRIS MOTORS (1926) LTD., COWLEY, OXFORD.
Dunlop Tyres Standard

BUY BRITISH AND BE PROUD OF IT

D.A. 94

MR. HINKLER'S TRIUMPH.

On Feb. 22 Mr. Bert Hinkler landed at Darwin, Northern Territory, at 17.55 hrs. (Australian time) thus completing his flight from London to Australia in sixteen days—two days under the time he set out to beat and twelve days less than the time taken by Sir Ross and Sir Keith Smith in 1919.

Although his destination was his home at Bundaberg, Queensland, his arrival at Darwin was the end of his undertaken flight. To all those who know Hinkler the success of the flight was considered a foregone conclusion.

There is no pilot in the World who better deserves the triumph of beating all records between England and Australia than does Mr. Bert Hinkler, and there is certainly no pilot whom those most intimately concerned with British Aviation would rather see achieve such a triumph. Mr. Hinkler is too quiet and retiring to have become a popular hero during these nearly ten years of Peace in which he has done so much good work for British Aviation. But he has endeared himself to all who have known him by his earnestness, his gentleness, his quaint humour, his kindliness and his unfailing good temper. And he has earned their admiration by his exceptional ability as an aviator, his judgment as an airman, in the exact sense of the word, his critical capacity as a tester of aeroplanes, and his ingenuity as a mechanical engineer.

He represents everything that is best in the type of Englishman who has populated Australia. He has all the sturdy independence of the typical Australian without the inherent hostility which spoils so many. And he has the true Australian self-reliance without the self-sufficiency which sometimes goes with it.

There is a legend in Australia that the Australian creed is "Get up every morning with a clear conscience. Look every man straight in the eye. And tell him to go to Hell." Mr. Hinkler has certainly always arisen with a clear conscience. And he has never hesitated to look Death himself in the eye. But his next inclination has apparently been to say, "Can I give you a hand with anything?" For his chief aim in life has always seemed to be to do something useful for somebody else.

If he had put in as much work for himself as he has for others in the past ten years he would be a rich man. But he has not a commercial mind,—as is proved by his inability to get such financial support for the perfectly achievable and very useful flight which he has just done as has been got in the past for hare-brained aviation schemes which have ended in disaster.

Still, everything comes to him who waits and now Bert Hinkler has the distinction of having beaten or set up a wh
crop of unofficial World's Records :—

(A) He has travelled from England to Australia in l
time than the journey has ever been done before. (The Sm
Brothers took a trifle longer than the fastest steamships, a
their time has never been beaten till Mr. Hinkler did it).

(B) He has beaten the aeroplane record from England
Australia.

(C) He is the first to make the journey single-handed.

(D) He has made the longest journey ever done by a li
aeroplane.

(E) He has travelled to Australia with lower power th
has anybody else.

(F) He has made the first non-stop journey from Lon
to Rome.

(G) He has made the fastest journey on record from Lon
to Calcutta.

(H) He has made the fastest journey from London
Singapore.

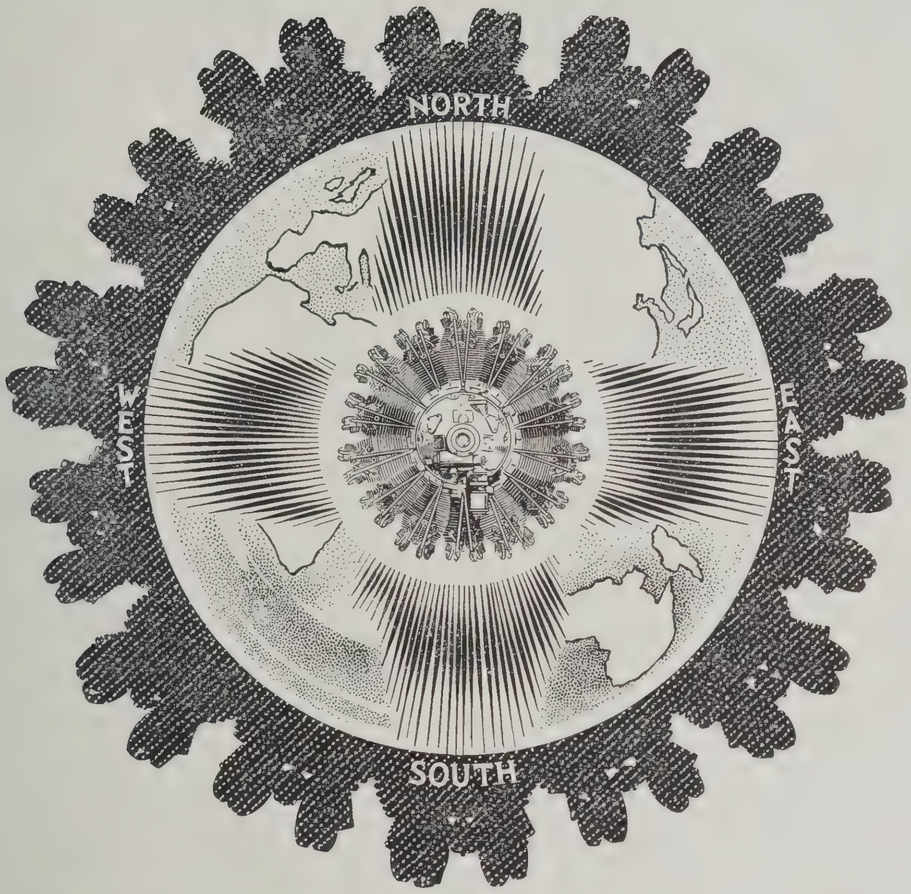
Probably he has beaten a few more. But those seem
be enough for one small man at one go. He has proved h
self in every way worthy of the pride with which his mot
has, from afar, followed his career even since he ca
"Home" to fight.

Mr. Hinkler himself would be the first to give full cre
to those whose work in the past have helped his pres
triumph, so one knows that one will have his agreement
mentioning that in apportioning admiration a goodly sh
must go to the makers of his machine and engine.

The Avro Avian has definitely proved itself to be am
the World's best aeroplanes, irrespective of size. And for
success much credit must go to Mr. Roy Chadwick, who,
sides the Avian, designed the first Baby Avro, in 1919,
which Mr. Hinkler made his non-stop flight to Turin,
later from Sydney to Bundaberg,—and to Mr. R. J. Parr
the Avro Manager at Hamble, where the small Avros w
first built and tried out, and where all the firm's exp
mental work is done. With them must be joined Mr. A.
A. V. Roe and Mr. John Lord, who have both always b
firm believers in Mr. Hinkler's ability.

Secondly credit must be given to the Cirrus engine.
designing the Cirrus engine, Mr. F. B. Halford made
light aeroplane a success, much in the same way that
building the Gnôme, the Séguin Brothers made flyin
success in 1909. And in having the courage and foresi
to produce the Cirrus, instead of being content to sit in
office and sell War-disposal stock, Lt.-Col. M. O. Darby

THE TRIUMPHANT MR. HINKLER.—Mr. Bert Hinkler and his Avro Avian (A.D.C. Cirrus II engine) taken just before he left England. The streamline pad behind the pilot's cockpit houses an inflatable boat.



A WORLD WIDE REPUTATION

THE greatest flights of Cobham and Koppen to and from the East Indies, Australia and South Africa have proved the reliability, ease of maintenance and economy of running of the Armstrong Siddeley Aero Engine.

These four models are now in use in 20 different countries of the world:

14 cyl. 385-425 h.p. Jaguar.	5 cyl. 125 h.p. Mongoose.
7 cyl. 180-210 h.p. Lynx.	5 cyl. 65-75 h.p. Genet.

ARMSTRONG SIDDELEY

MOTORS LIMITED.

WORKS & AERODROME: Coventry.
LONDON: 10, Old Bond Street, W.1.

FLOWN AND KNOWN ALL OVER THE WORLD

A 61

A.D.C. Aircraft Ltd., made possible Mr. Halford's success in this particular line. Both Col. Darby and Mr. Halford are, one hopes, reaping well-deserved reward from the mass-production of Cirrus engines in these days,—for, despite, or because of, the trials and tribulations of the Cirrus Mk. I, in its teething troubles, and the rude things which have been said about it in consequence, the Cirrus Mk. II has proved itself to be one of the World's best engines. And Mr. Hinkler's triumph has, deservedly, sealed the success of the Cirrus.

Of the makers of the accessories during the fact others will write in their proper places, but to them all,—makers of material, fuel, fittings and what not—one would offer hearty congratulations on their part in this multi-record success.

A prophet is not without honour save in his own country, but Mr. Hinkler—perhaps because he has been so long away—seems to be receiving attention at home which is almost worthy of his performance. And one hopes that, having had so little financial support in this country, he may receive adequate reward among his own people. Whatever he gets, either here or in Australia, he will deserve more.—C. G. G.

Hinkler's desire to fly to Australia has been a long and deep-seated one. Almost as soon as he was demobilised he had made up his mind to make the flight.

His first attempt was planned to be made on a Sopwith Dove (80 h.p. Le Rhône engine) and a machine of this type was actually fitted up for the flight. He intended to start in May, 1919, but his departure was delayed for months by arguments over the International Air Convention. By time things were likely to be straightened out the Sopwith company received orders for several Doves with the result that his machine was re-converted to a two-seater in order to fill the order.

Hinkler then negotiated with the Avro Company and acquired the use of an Avro Baby (30 h.p. Green engine), the forerunner of the light aeroplane and predecessor to the Avro Avian.

On this machine he left Croydon on May 31, 1920, with the intention of flying to Australia. He flew non-stop to Turin, a distance of 650 miles in 9 hrs. 35 mins., and on June 3 he continued to Rome. Here he came to the conclusion that he required a more comprehensive set of spares, and this, coupled with the fact that there was an embargo on flying over Arabia, caused him to decide to return to England to await a more favourable opportunity. For his flight from London to Turin he was awarded the Britannia Trophy for the most meritorious performance during 1920.

In April, 1921, he joined A. V. Roe and Co. Ltd. as test pilot, and he served continually with them until he began making preparations for his present flight. In his capacity as test pilot he flew every new type of Avro aircraft, ranging from the smallest motor-cycle-engined light aeroplane to the first aeroplane to be fitted with the 1,000 h.p. Napier Cub engine and the Avro-built Autogyros. Similarly, he has competed at most air meetings in this country with conspicuous success.

Soon after joining the company he took the Avro Baby to Australia, and in the course of his flying out there he flew from Sydney to Bundaberg non-stop, a distance of about 800 miles, actually landing in the main street of th town and taxying up to the door of his home.

In the first *Daily Mail* competition at Lympne, in 1923, h won the aggregate mileage prize offered by the Society Motor Manufacturers and Traders by flying the Avro 5 monoplane, fitted with a 698 c.c. Blackburne engine, ove 80 laps of a 12½-mile course, a total distance of approx mately 1,000 miles, with an average petrol consumption 54.6 miles to the gallon.

In 1924 he won the Grosvenor Cup on an Avro Av (Bristol Cherub engine) at an average speed of 65 m.p.h.

In 1926 at Lympne he won the handicap race for th Society of Motor Manufacturers' prize on the first Av Avian (Armstrong-Siddeley Genet engine) at a speed 90.2 m.p.h.

With this machine, G-EBOV, he entered for most of th air races during 1927 season and achieved a number successes with it, fitted at first with the Genet engine an later with the A.D.C. Cirrus engine.

Each time G-EBOV appeared in public it seemed to hav a different appearance. Apart from the change of engin the wings were altered from those with the original squar cut wing tips to the now standard rounded-tip type. The the undercarriage was raised, and finally Hinkler's pate divided type was fitted. The tail unit was altered, ar quite apart from all these obvious external alteration G-EBOV was continually being fitted with little "gadgets of Hinkler's own invention.

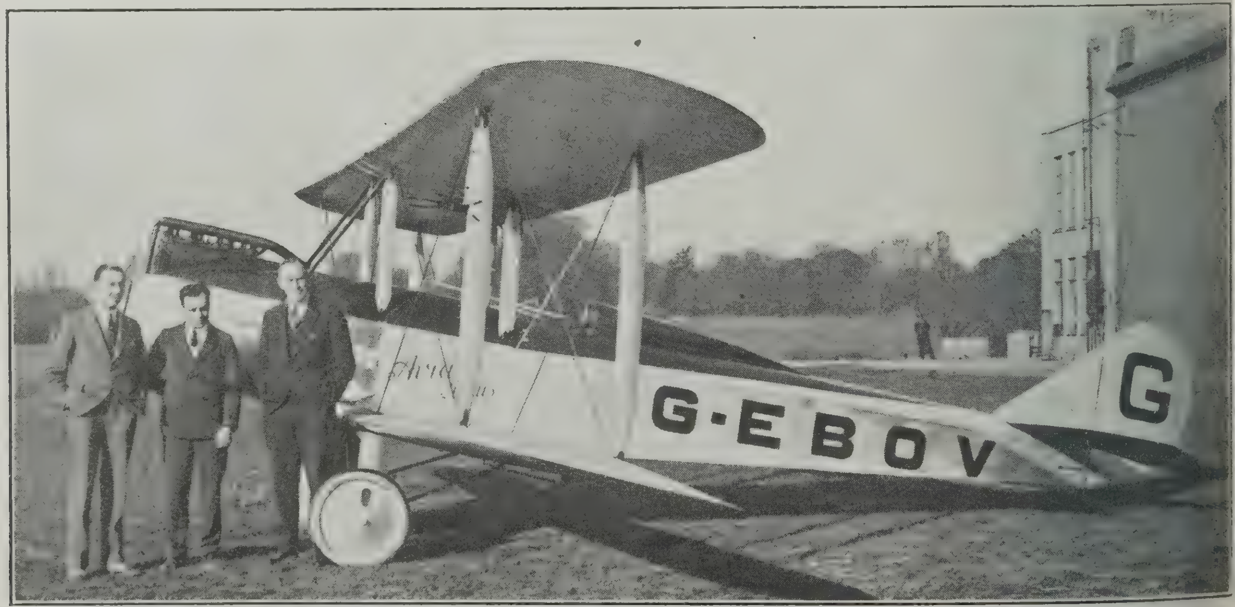
It was on this machine that Hinkler flew from London Riga, 1,100 miles non-stop, last year, and now he has flow it to Australia in record time—a splendid record for a m chine which has, to all intents and purposes, acted as sort of experimental base for the development of the Av Avian from September, 1926, to the present day. It actually the oldest Avian in existence, and, judging from i performance, it is well up to the modern Avian standard.

The engine used, an A.D.C. Cirrus, is the sixth engine the Mark II. series. When it is remembered that the fir and second engines of this series were used by Messr Stack and Leete on their flight to India, and that sin then this type has been used on a number of notable lig aeroplane flights and is in use in nearly every corner of t globe, the well-deserved reputation this engine has gain is only understandable.

Now that the flight is completed it is not out of place give a complete itinerary of the journey before dealing wi any of the latter parts of it that have not yet been describ in THE AEROPLANE :—

Feb. 7, Croydon-Rome (1,100 miles); 8, Rome-Ma (500 miles); 9, Malta-Tobruk (400 miles); 10, Tobruk-Raml (420 miles); 12, Ramleh-Basra (950 miles); 13, Basra-Ja (690 miles); 14, Jask-Karachi (600 miles); 15, Karachi-Caw pore (850 miles); 16, Cawnpore-Calcutta (600 miles); Calcutta-Rangoon (620 miles); 18, Rangoon-Victoria Po (500 miles); 19, Victoria Point-Singapore (850 miles); Singapore-Bandoeng (640 miles); 21, Bandoeng-Bima (miles); 22, Bima-Darwin (950 miles); 24, Darwin-Alexand (500 miles); 25, Alexandria-Camooweal (200 miles); Camooweal-Longreach (520 miles); 27, Longreach-Bundab (550 miles).

(*Continued on page* 295.)



THE MACHINE AND THE MEN.—The Avro Avian (A.D.C. Cirrus II engine) at Hamble before leaving for Croydon and Australia. With Mr. Hinkler are Mr. Roy Chadwick (left) and Mr. R. J. Parrott (right), Chief Designer and General Manager respectively of the Experimental Establishment of A. V. Roe and Co. Ltd.

AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

A WORD OF THANKS.

his, the second of the new series of *Aeronautical gineering,* will be found to follow closely, both in arrange- nt and in the nature of its contents, the first issue which eared on January 25. The invitation, contained in the word of that first issue, that readers would express their nion and their criticisms of the form and contents of t issue, has not passed unaccepted.

t has produced a number of authoritative opinions— of them encouraging—and some criticism, none of it tructive.

uch criticism has been almost entirely directed to the nature of the omissions from *Aeronautical Engineering.* Many things were omitted which it had been better to include, if such inclusion had not entailed the omission of items which actually appeared. These omissions are the result of lack of available space and of that only.

It is hoped that in the future this limitation of space may be in part removed. In the meantime one would wish to express the thanks of all those who have been concerned in the production of the first issue of *Aeronautical Engineering* to those readers who have expressed their approval of those efforts.

SOME NOTES ON METAL FUSELAGE CONSTRUCTION.

By F. Sigrist, M.B.E., A.F.R.Ae.S.*

he question of metal construction is one tending to com- ation, and bristling with grounds for contention. In e respects we are still in the experimental stage, and others we have made considerable progress. There is btless room for further research, particularly on wing ctures, and in the material field, and for this reason I end to restrict my remarks to fuselage construction only, ere the production rather than the aerodynamic aspect ninates.

et us consider firstly the essential requirements in a tal structure of this description, not necessarily in order importance. They are :—

A) Low weight; (B) Strength; (C) Rigidity; (D) Produc- n qualities; (E) Maintenance aspect; and (F) Ease of lacements in emergency.

econdly, there must be considered the classes of material ilable and suitable, including :—(1) Steel tubing and bar; Steel sheet (steel in both cases including alloy steels); Duralumin tubing; (4) Duralumin sheet.

do not wish to enter into controversy as to whether l or duralumin is the better material. Each has certain antages claimed by its adherents, and personally I be- e there is room for both. The design and the method which the material becomes the completed unit, how- r, do both afford scope for ingenuity.

p to the present there has been certain fairly standard- l procedure in vogue. In this country the most favoured ign so far is the pin-jointed type, utilising steel tubing longerons and struts, inter-connected by fork ends ned and sweated and wrapper plates or machined fit- gs. In so far as strength and rigidity were concerned, makes an excellent structure, although somewhat vy.

he production qualities are not particularly good, owing the amount of machining operations on the fork ends fittings. In maintenance the corrosion problem, espe- ly where soft soldering occurred, calls for the exercise continual care and inspection. Ease of replacement in emergency, such as forced landing, is not good owing to complication of the joints.

uralumin structures on similar lines were used to a er extent, but these were subject to the same dis- antages. If anything, they were more costly from the duction point of view and offered more difficulty as ards protection from corrosion.

trip steel, rolled to sections and rivetted together, has n utilised in certain cases. I have no data available as the weights, but I am quite prepared to accept a favour- comparison. As regards strength and rigidity, this e should be quite satisfactory, but the production, main- ance and replacement qualities are not as good as the -joint type.

roduction is initially costly, continual inspection in ser- is necessary, and it is most difficult to effect an emer- cy repair.

or some time welding has been employed to a great ent by Continental and American concerns, and has latterly made headway in this country. Apart from the vexed question of the human element there is at the moment only one really satisfactory welding steel, especially for tubes.

A fuselage of this construction probably shows to advantage from the production point of view when jigs are available, but with this exception, despite strong opinion to the contrary, I cannot see any particular merit in it at present. It results in a heavy structure, rigid perhaps, but of doubtful strength. It is impossible to carry out a satisfactory inspection, and though it is claimed that an emergency repair can be carried out quicker than is the case in any other form of construction, I have yet to hear of an instance. It is perhaps of significance that although accident statistics of machines with welded fuselages are not available, except from inspired sources, American constructors are resorting to other methods.

It is with the object of overcoming the disadvantages of each of the various forms discussed, and obtaining a basic type of construction combining all desirable features, that the form I will describe has been developed by the design engineers at the works of the H. G. Hawker Engineering Co. Ltd. It was decided at the onset that the use of tubing offered the best solution of the problem, and eventually a system was evolved which, whilst allowing the designer a wide field for the choice of materials, still retained the essential advantages.

The structure itself is preferably on the Warren girder principle. A reference to the illustrations will disclose the main details, and, as will be seen, these consist of tubes, flat plates, tubular rivets and cupped bolts.

The longerons are tubing of either square, rectangular or round section, and if the latter, squared or flattened at the point of contact with the plates. The struts are also of tubing, and any desired section can be used provided it is squared or flattened to receive the plates.

Attachment between the two is by means of the flat plates rivetted to the strut and bolted to the longeron by means of the cupped bolt. The head of the latter receives the ball of the cross tube, and it is interesting to note that by using two rivets in each of the struts and the bolt only in the longeron, the former are perfectly rigid, and the latter has just that slight degree of resilience necessary in a joint of this description.

The wiring plates are in two portions, one single and one double, thus ensuring a wide angular adjustment. This type of joint is used throughout the fuselage, and the resultant structure, as since proved, is lighter, stronger and more rigid than any other type yet produced.

This particular type of fuselage is a real effort at standardisation, and it has the following outstanding features :—

(A) Any material or combination of materials can be used, and with a choice of sections, e.g., steel longerons can be connected to duralumin struts, round tubing can be attached to square tubing, and tubing of different diameters easily assembled together.

(B) The method of attachment is extremely simple and can be carried out by semi-skilled labour. The squaring or flattening operation can be performed in a few minutes.

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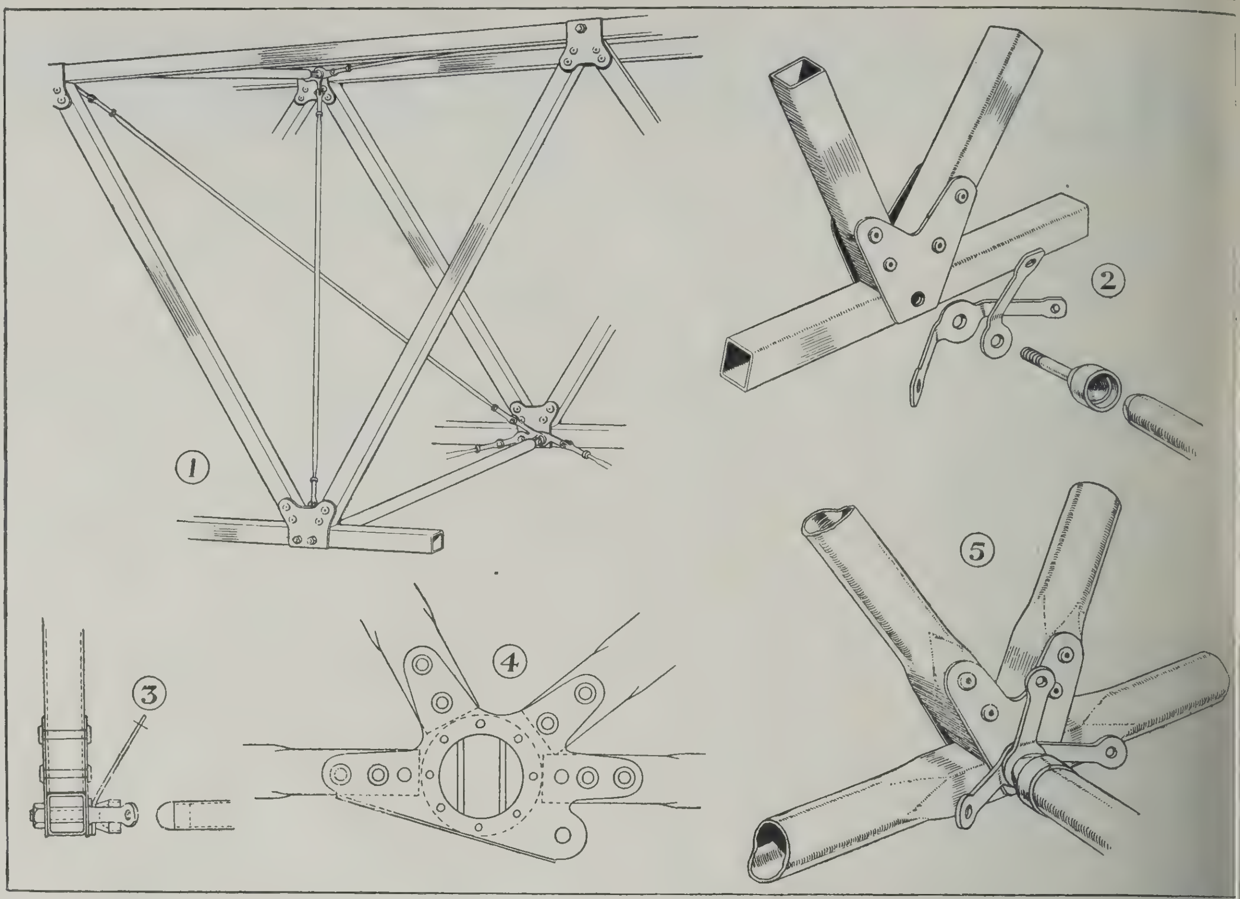
* Joint Managing Director, The Hawker Engineering Co. Ltd.



HAWKER METAL FUSELAGE CONSTRUCTION.—In 1 is shown a part of an assembled fuselage structure using square tubes throughout. This is an example of a relatively early form of Hawker construction. The joint plates are here wrapped round three sides of the tube, and fork and eye terminals are used for the cross-struts. In 2 a later and simpler type of joint is shown. The joint plates are separated one on each side of the tube and are rivetted to the struts. They are held to the longeron only by the cup bolt, which also secures the two wiring lugs. The horizontal strut has merely a ball-end fitting the cup in the bolt. At 3 is a section through a joint such as 2. In 4 is shown how simply a special joint—in this case for a cross-tube providing attachment for a wing spar—can be made with this construction. In 5 is shown a joint precisely similar to that at 2 applied to ordinary circular tubes which are merely rolled to a square section at the joints.

(C) The use of the cupped bolt and ball-ended stay tube ensures perfect and immediate alignment.

(D) Machining operations, except for the bolt and ball-end are eliminated.

(E) Maintenance is simplified, and a careful inspection can be made in a minimum time.

(F) Interchangeability is simplified and reserve spares can be stored in the shape of tubes or finished parts without fear of deterioration.

(G) Emergency repairs can be quickly and efficiently made. It has often been pointed out that in a welded structure an emergency repair can be carried out on the spot provided an oxy-acetylene apparatus is available. In the form of construction discussed herein, it is possible to effect such repair with a piece of tubing of practically any ordinary commercial quality and two bolts—surely a simpler operation.

(H) The work of the designer is to some extent assisted. He can utilise any class of material he desires from high tensile steel to duralumin with alterations to gauge only. Furthermore, a small initial outlay on press tools will speed up experimental machines. It is possible by using six different sizes of joint plates and four different sizes of wiring lugs to standardise these items for almost any class of machine.

(I) Production in emergency is an aspect on which I must
comment. Any available material can be utilised at
moment's notice for this type of construction. The act
unit can be assembled using a very simple jig by se
skilled labour in a lesser number of man-hours than
other type of construction. It is a type, moreover, wh
can be efficiently produced by firms without previous
perience of aircraft construction.

As far as I am aware this is the only system by wh
material possessing vastly different qualities can be chea
and efficiently assembled into an homogeneous unit. Un
service conditions it has proved to possess practically 10
reliability, and re-conditioning under these circumstan
is reduced to a minimum.

In conclusion I would briefly refer to the type of eng
mounting utilised with a radial engine. On the front
tion of the fuselage four ball ends are attached, the mou
ing itself consisting of a flanged steel plate, to which st
tubes squared at the ends are attached by plates and bo
At the point of contact a cupped socket ensures alignm
and adjustment over the ball ends of the front of
fuselage. This mounting gives wide accessibility
ensures a quickly detachable unit.

It should be noted that this system of construction
covered by patents, the property of the H. G. Haw
Engineering Co. Ltd., and that it is being used in all
more recent types of Hawker aircraft.

COMPRESSION-IGNITION ENGINE EXPERIMENTS.

The paper read by Mr. H. B. Taylor, A.F.R.Ae.S. on Nov. 3 before a joint meeting of the Royal Aeronautical Society and the Institution of Automobile Engineers, under the title "High Speed Compression-Ignition Engine Research," dealt with certain experiments made at the Royal Aircraft Establishment with a single cylinder unit of 8 inch bore and 11 inch stroke running on shale oil.

A quantity of fuel oil determined by the displacement of a cam-operated pump was injected at or about the end of each compression stroke.

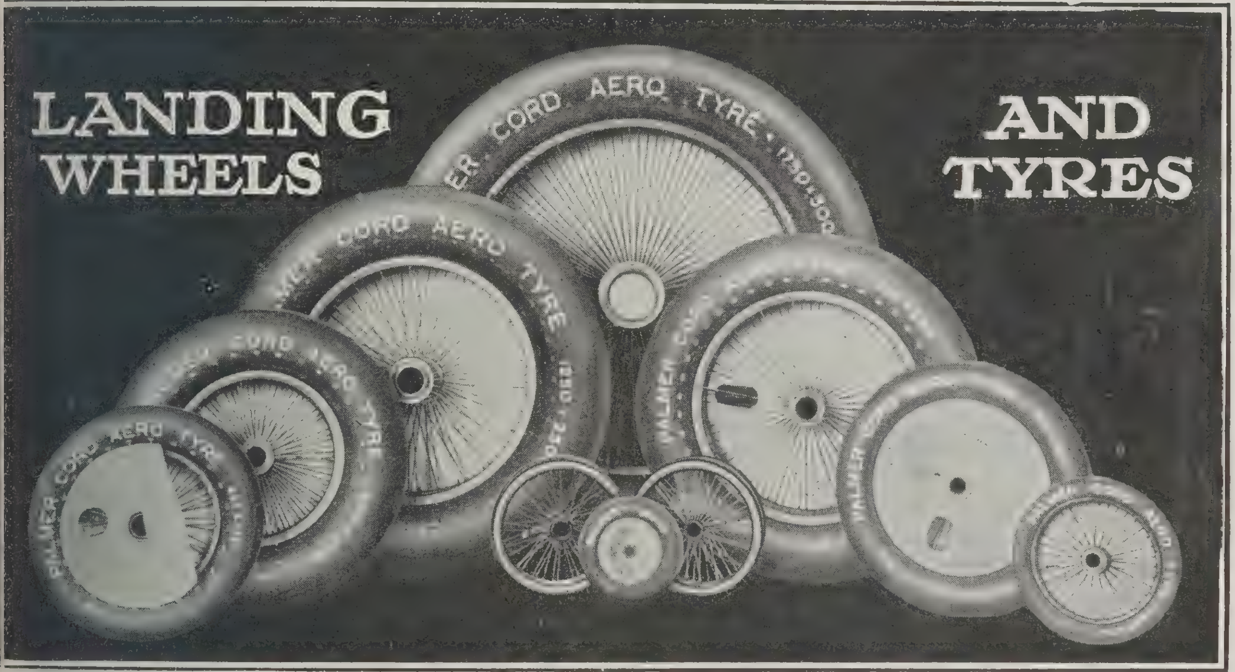
The experiments described in the paper were mainly concerned with variations in the design of the nozzles thro
which the fuel was injected into the cylinder, and with va
tions in the timing of the fuel injection.

The results show that exceedingly low fuel consumption
be obtained with this type of engine, more particularly
such powers as would be used for cruising purposes in an
craft. This fact is of course already known. The aut
did not however hold out any hope of getting the weight
an engine of this down to less than 1 to 2 lbs. per h
more than the weight of a petrol engine of similar outp
The figure of 1 lb. would apply to an air-cooled and 2
to a water-cooled engine.

For his great record flight from England to Australia on the Avro Avian,

Mr. BERT HINKLER CHOSE

PALMER



just as Sir Ross Smith and Sir Keith Smith chose Palmer equipment for their England—Australia flight in 1919.

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(522)

NEW AIRCRAFT.

The Keystone Pathfinder.

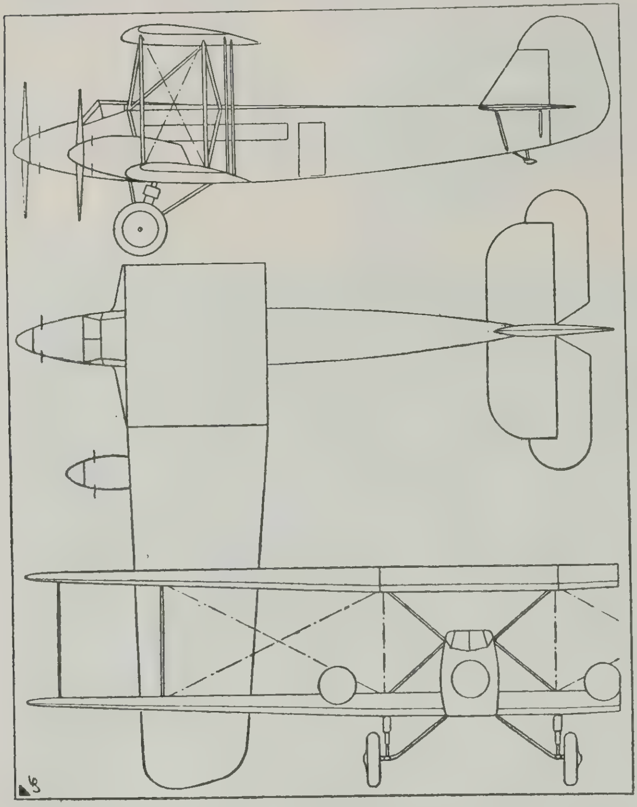
Made by The Keystone Aircraft Corporation, Bristol, Pa., U.S.A. (Three-engined passenger carrier, developed from the Keystone Super-Cyclops Bomber.)

Wings.—Equal-winged single-bay biplane. Thick section (U.S.A. 45), Tapered in chord from centre section outwards. Box type timber spars and Warren girder ribs. Narrow chord ailerons on top and bottom wings. Very wide centre sections on both wings supported by outwardly raking struts from fuselage.

Fuselage.—Rectangular section, of chrome-molybdenum steel tube, welded throughout. No wire bracing.

Tail.—Normal design, steel tube frame, fabric covered. Horizontal plane adjustable in the air. Rudder and elevators horn-balanced.

Undercarriage.—Split axle Vee type, telescopic front legs with oleo-shock-absorbers. Wide wheel track and independent wheel-brakes.



Power Plant.—Three Wright Whirlwind engines, type J.5, 220 h.p. each. One in nose of fuselage, and one mounted on steel tube framed nacelle on each bottom wing just outboard of centre section struts. Gravity fuel tanks (300 U.S. = 250 Imp. gallons = 1,130 litres) in upper centre section. Curtiss-Reed forged duralumin airscrews.

Accommodation.—Two side-by-side seats for pilot and mechanic fitted with wind and side and roof screens ahead of leading edge. Dual controls with seats adjustable for height and rudder bars for reach. Passenger cabin (about 14 ft. 0 in. (4 m.) long) immediately behind pilot's cockpit, fitted with 10 wicker chairs in two rows with very narrow gangway between. Glass windows (openable) along whole of each side of cabin. Cabin lined with Balsam wool to absorb sound. Lavatory and luggage compartment behi cabin. Entrance door, with folding steps on each side.

Dimensions.—Span 66 ft. 0 in. (20.1 m.), Chord 10 ft. 6 in. (3.12 tapering to 7 ft. 0 in. (2.14 m.), Length 44 ft. 4 in. (13.5 m.), Wi area 1,150 sq. ft. (103 sq. m.).

Weights and Loadings.—Weight empty 6,356 lbs. (2,890 kg.), Cr 360 lbs. (167 kg.), Fuel 1,800 lbs. (817 kg.), Useful load 2,100 (955 kg.), Weight loaded 10,841 lbs. (4,930 kg.), Wing loading lbs./sq. ft. (47.8 kg./sq. m.), Power loading 16.4 lbs./ (7.46 kg./h.p.).

Performance.—Max. speed 115 m.p.h. (185 km.h), Min. speed 55 m. (88 km.h.), Climb at ground 570 ft. (174 m.) per min., Range miles (800 km.).

The Keystone Pronto.

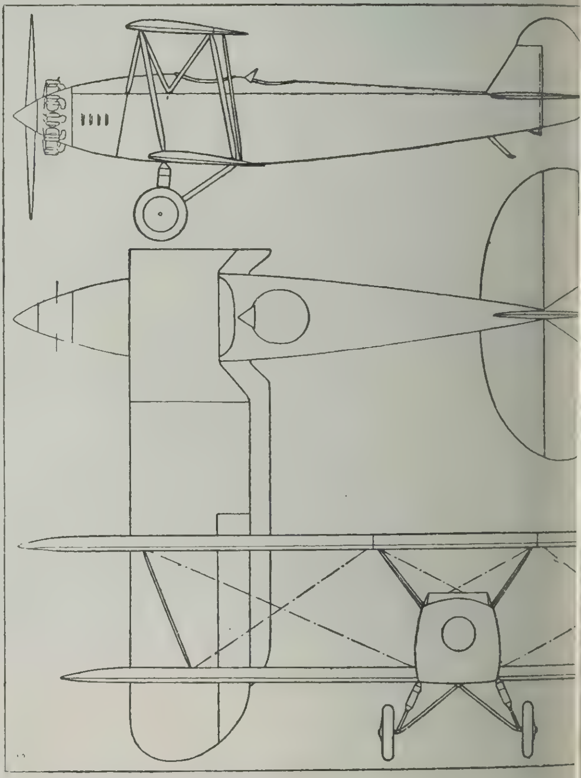
Made by The Keystone Aircraft Corporation, Bristol, Pa., U. (General utility commercial machine, suitable for carrying passengers and a considerable load of goods and mail, for pho graphic, survey work, etc.)

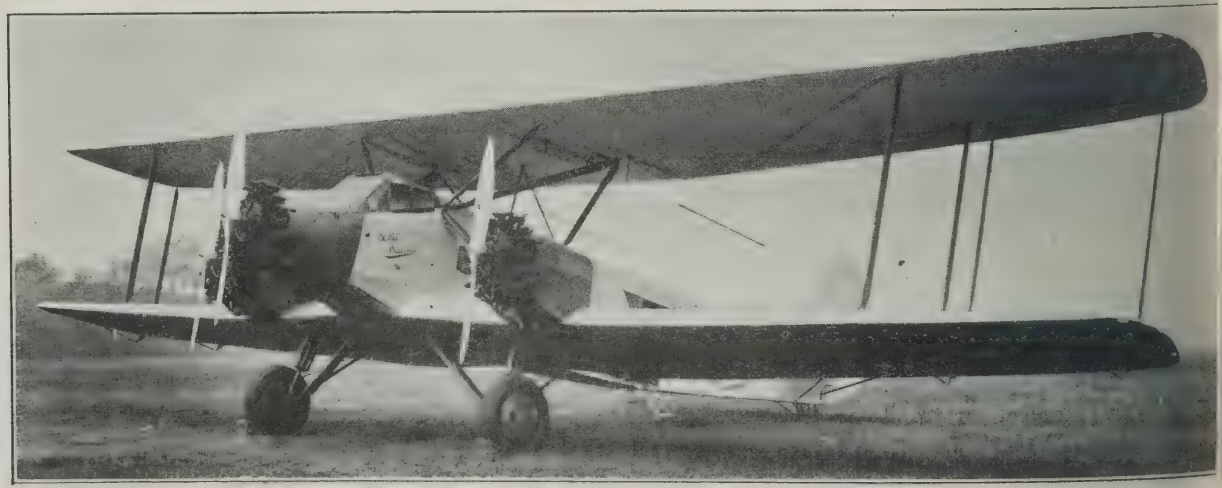
Wings.—Equal winged single-bay biplane, with slight stag Ailerons (unbalanced) on top and bottom wings. Göttingen aerofoil section. Standard timber construction with steel interplane struts and wire bracing.

Fuselage.—Rectangular section, welded steel tube construction, rig braced.

Tail.—Steel tube framing. Fin framing integral with fuselage. Ru with horn balance.

Undercarriage.—Interchangeable floats or wheels. Wheel un carriage split-axle Vee type, front leg telescopic, with oil d pot. Float chassis of four struts and two cross members, braced. Floats long single-step type, of duralumin.





The Keystone Pathfinder (three Wright Whirlwind engines).

The above is a photograph of the
AVRO "AVIAN"
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Mr. BERT HINKLER
has flown alone to
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Power Plant.—One Wright Whirlwind J.5 engine of 220 h.p. (May be fitted with Roots-blower type supercharger.) Two 30-gallon (136-litre) fuel tanks in upper wing.

Accommodation.—Seats for two side-by-side in open cockpit below centre section. Pilot immediately behind. Two luggage or goods compartments, one ahead of and one aft of cockpits.

Dimensions.—Span 38 ft. 11 in. (11.8 m.), Length 26 ft. 9 in. (8.15 m.), Chord 5 ft. 3 in. (1.6 m.), Wing area 365 sq. ft. (34 sq. m.).

Weights and Loadings.—Land machine: Weight empty 1,975 lbs. (900 kg.), Loaded 3,285 lbs. (1,490 kg.), Wing loading 9 lbs./sq. ft. (45 kg./sq. m.), Power loading 14.6 lbs./h.p. (6.5 kg./h.p.). Seaplane: Weight empty 2,375 lbs. (1,080 kg.), Loaded 3,685 lbs. (1,675 kg.), Wing loading 10.1 lbs./sq. ft. (49.3 kg./sq. m.), Power loading 16 lbs./h.p. (7.3 kg./h.p.).

Performances.—Land machine at 3,204 lbs. (1,450 kg.) gross: Max. speed 112 m.p.h. (180 km.h.), Min. speed .37 m.p.h. (60 km.h.), Climb at sea level 800 ft. (245 m.) per min., Climb to 10,000 ft. (3,050 m.) 16½ min. Seaplane at 3,504 lbs. (1,590 kg.): Max. speed 106 m.p.h. (171 km.h.), Take off speed 44 m.p.h. (71 km.h.), Climb to 10,400 ft. (3,180 m.) 40 mins.

The Laird Commercial Biplane.

Made by E. M. Laird Airplane Co., Chicago, Ill., U.S.A. (Three- or four- seater general utility commercial machine.)

Wings.—Single bay biplane, top wing slightly larger in span and chord than bottom. Unbalanced ailerons on top only. Laminated spruce box-spars. Ribs of three-ply, reinforced with spruce struts and spruce capping strips. Solid spruce compression struts and solid (8 G) drag bracing. Ailerons independently controlled by "Arens" control system. (This is rather like a Bowden wire but has a solid outer casing and will transmit both tension and compression loads.)

Fuselage.—Of duralumin tube, with steel sleeve fittings at all joints, wire braced. Nose forming engine mount of steel tube, detachable from main framing.

Tail.—Welded steel tube frame fabric covered. Tail plane adjustable by lever and quadrant in cockpit. Fin adjustable for torque reaction on ground.

Undercarriage.—Split axle, Vee type. Sauzedde wheels and wheel-brakes at 7 ft. track.

Power Plant.—Standard, Curtiss OX-5 engine, 90 h.p. Alternatively a Curtiss C.6 of 160 h.p., or a Wright Whirlwind of 220 h.p. may be fitted.

Accommodation.—Two-seater side-by-side open cockpit below centre section. Pilot's cockpit behind trailing edge. With higher-powered engines this may be arranged with two side-by-side seats.

Dimensions.—Span top 34 ft. 0 in. (11.1 m.), Bottom 30 ft. 0 in. (9.82 m.), Length 23 ft. 6 in. (7.7 m.), Height 9 ft. 3 in. (3.02 m.), Wing area 300 sq. ft. (28 sq. m.).

Weights and Loadings.—With OX-5 engine: Weight empty 1,350 lbs. (614 kg.), Pay load 300 lbs. (136 kg.), Fuel (60 galls. U.S.) say 380 lbs. (172 kg.). Loaded weight unknown.

With Curtiss C.6 engine: Weight empty 1,500 lbs. (680 kg.), Pay load 500 lbs. (228 kg.), Fuel (75 galls. U.S.) say 470 lbs. (213 kg), Loaded weight unknown.

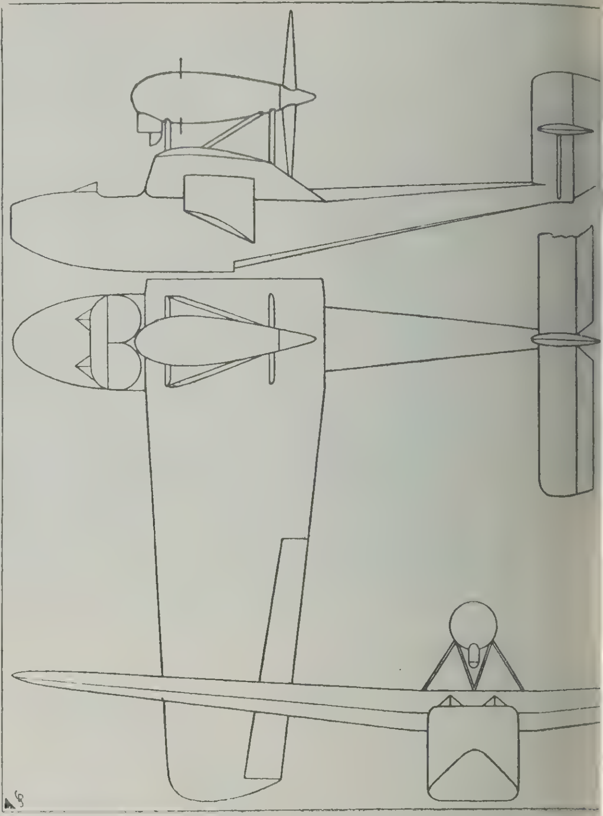
With Wright Whirlwind engine: Weight empty 1,550 lbs. (705 kg.), Pay load 800 lbs. (363 kg.), Fuel (80 galls. U.S.) say 500 lbs. (228 kg.), Loaded weight unknown.

Performance.—OX-5 engine: Max. speed 95 m.p.h. (153 km.h.), Landing speed 40 m.p.h. (64 km.h.), Climb from ground 600 ft./min. (183 m./min.), Ceiling 16,000 ft. (4,880 m.), Range 550 miles (685 km.) in 6½ hours.

C.6 engine: Max. speed 120 m.p.h. (193 km.h.), Landing speed 45 m.p.h.) (72.5 km.h.), Climb to 7,500 ft. (2,300 m.), 10 mins., Range 600 miles (970 km.), in 6 hours.

Whirlwind engine: Max. speed 130 m.p.h. (210 km.h.), Landing speed 45 m.p.h. (72.5 km.h.), Climb to 10,000 ft. (3,050 m.) 10 mins., Range 600 miles (970 km) in 6 hours.

The Liore et Olivier Flying Boat H-180.



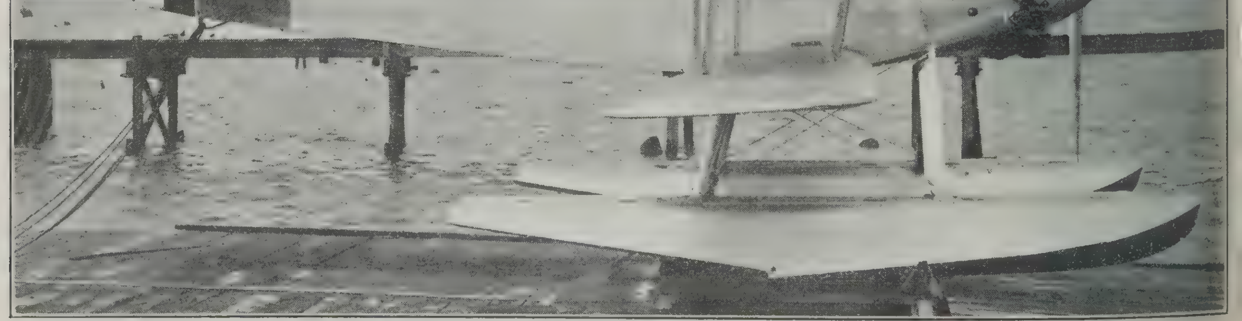
Made by Etablissements Liore et Olivier, Rue de Villiers, Levallo Perret, France. (Two-seater flying-boat for training, touring, other light service.)

Wings.—Single piece cantilever monoplane. Wing fastened directly top of hull by four bolts. Tapers in chord and thickness of prof from centre line to tip. Built on two wooden spars with wood ribs. There is a marked dihedral angle. Long small-cho ailerons are inset from wing-tip.

Hull.—Rectangular section, with flat bottom and one step. Built wood and three-ply covered. Several water-tight compartme built in. Strong rubbing strakes are fitted along the bottom permit of beaching safely on sand or a slipway.

Tail.—A horizontal tail plane, nearly rectangular in plan, is carri on the fin framing above the tail of the hull and is braced bel alone to the hull by struts. Elevators of very narrow chord a used. Rudder and fin together are nearly rectangular in elev tion. No control surfaces are balanced.

Undercarriage.—For use on land a wheeled undercarriage may fitted. Two vertical telescopic struts are attached below the fr wing spar on each side and support a divided axle hinged to t lower edge of the hull. A thrust tube on each side runs forwa from the hull to the junction of axle and vertical tube.



The Keystone Pronto as a seaplane (Wright Whirlwind engine).

RUS

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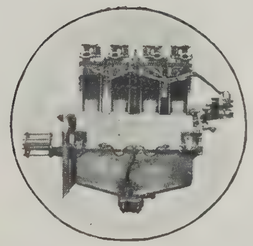

"THE MINIATURE MARVEL"
(vide The Press).

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Power Plant.—Either the Salmson 9 A.C. engine (120 h.p.), the Le Rhône or Clerget rotaries of 110 or 130 h.p., the Hispano-Suiza 180 h.p., or the new 100 h.p. Lorraine air-cooled engine.. The engine is carried high above the wing in a stream-lined nacelle and drives a pusher airscrew—through a long shaft—just in front of the trailing edge. The oil tank is within the nacelle. The nacelle is supported on a steel tube framing. Two petrol tanks in the wing.

Accommodation.—Two side-by-side seats in an open cockpit ahead of the wing. The machine may alternatively be made into a three-seated cabin machine, pilot in front, also the part of the hull below the wing may be used for mail or light freight.

Dimensions.—Span 11.2 m. (36 ft. 10 in.), Length 7.25 m. (23 ft. 10 in.), Height 2.2 m. (7 ft. 3 in.), Wing area 17.2 sq. m. (185 sq. ft.).

Weights and Loadings.—Weight empty 680 kg. (1,495 lbs.), Fuel and oil 100 kg. (220 lbs.), Crew and luggage 180 kg. (396 lbs.), Fully loaded 960 kg. (2,120 lbs.), Wing loading 55.8 kg. per sq./m. (11.5 lbs./sq. ft.), Power loading (120 h.p.) 8 kg. (17.6 lbs.) per h.p.

Performance (estimated).—Max. speed 165 km.h. (103 m.p.h.), Speed at 2,000 m. (6,560 ft.) 154 km.h. (96 m.p.h.)., Climb to 2,000 m. (6,560 ft.) 18 mins., Ceiling 3,500 m. (11,500 ft.), Range 660 km. (435 miles).—(*Les Ailes, Jan.* 12, 1928.)

The Stiles "Dragon Fly."

Made by The Stiles Aircraft. Inc., 538, South Dearborn Street, Chicago, Ill. (Two-seater sporting and training machine.)

Wings.—Strut braced parasol monoplane. Ailerons extend over whole span except centre section. Two steel tube struts, both attached to lower rail of fuselage below rear wing spar and running to front and rear span about half-way along wings. Aerofoil section Clark "Y."

Fuselage.—Rectangular section with domed top deck.

Tail Unit.—Of conventional form. Rudder only balanced.

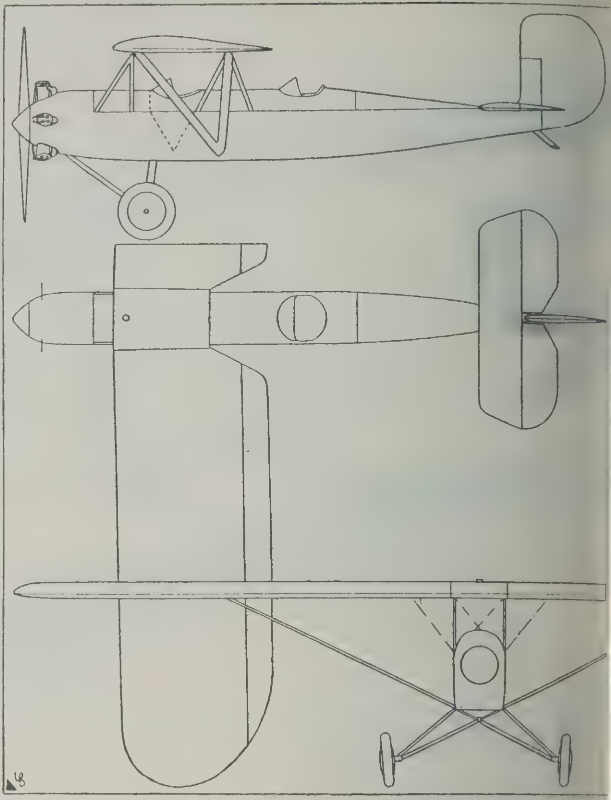
Undercarriage.—Split axle type, of steel tube.

Power Plant.—One "Detroit Air Cat" five-cylinder air-cooled radial engine of 80 h.p. carried on a steel engine mount. Main fuel tank, 20 American gallons (=nearly 17 Imp. galls.) in top centre section.

Accommodation.—Two open cockpits, one below centre section and one aft of trailing edge. Side entrance door fitted to front cockpit only.

Dimensions.—Span 36 ft. 0 in. (11.0 m.), Chord 6 ft. 0 in. (1.83 m.), Length 23 ft. 11 in. (7.3 m.), Height 8 ft. 1 in. (2.46 m.), Wing area 200 sq. ft. (18.6 sq. m.).

Weights and Loadings.—Weight empty 850 lbs. (387 kg.), Crew (2) 320 lbs. (146 kg.), Fuel and oil 135 lbs. (61 kg.), Baggage 50 lbs. (22.5 kg.), Fully loaded 1,367 lbs. (620 kg.), Wing loading 6.8 lbs./sq. ft. (33.3 kg./sq. m.), Power loading 17.1 lbs./h.p. (7.75 kg./h.p.).



Performance (estimated).—Max. speed 105 m.p.h. (169 km.h.), Landing speed 38 m.p.h. (61 km.h.), Rate of climb at sea level 800 ft./min. (244 m/min.), Cruising range at 85 m.p.h. (137 km.h.), 450 mil (725 km.) = $5\frac{1}{4}$ hours.

Price.—$1,985 (£410) at Chicago.

Note.—Both in general arrangement and in dimensions there is substantial identity between this machine and the Westland Widgeo

NEW ENGINES.

The Armstrong-Siddeley Mongoose Mk II.

Made by Armstrong-Siddeley Motors Ltd., Coventry. (Five-cylinder air-cooled radial engine for training and other moderate-power aircraft.)

Cylinders.—5 in. (127 m/m.) bore x $5\frac{1}{2}$ in. (140 m/m.) stroke. Standard Armstrong-Siddeley construction, steel barrels and screwed-on light alloy heads. Cylinder arrangement is unusual in that the vertical cylinder is at the bottom instead of the top of the engine.

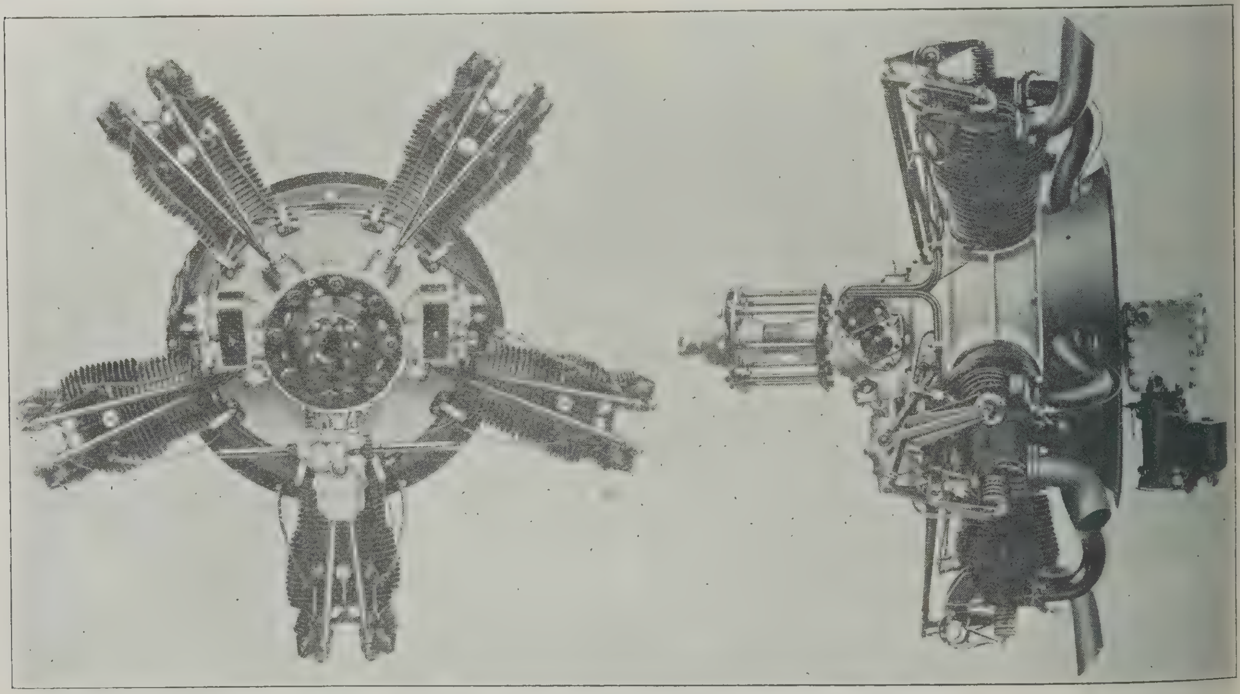
Compression Ratio.—5 to 1.

Valve Gear.—Two overhead inclined valves per cylinder operated through rocker arms and tappet rods by an epicyclically-driv cam-ring concentric with crankshaft.

Pistons.—Semi-slipper type with three rings above gudgeon pin.

Crankshaft.—Single throw one piece shaft, carried in two journ roller bearings, the front one in a housing in crankcase castin the rear one in a housing in rear crankcase cover. A ball thru race is carried in the front cover of crankcase.

Crankcase.—One casting of light alloy includes the cylinder spigot the cam gear case, and the induction chamber. Front and re covers complete the assembly.



The Armstrong-Siddeley Mongoose Mk. II. Note the unusual arrangement of a vertical cylinder at the bottom.

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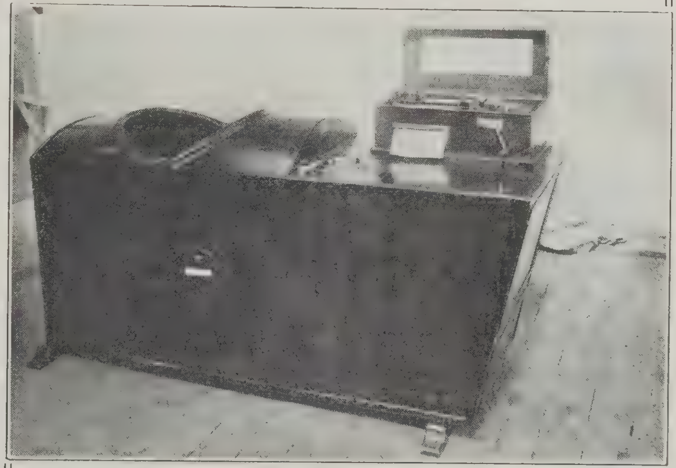

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Auxiliary Gears.—Magneto and oil pump drives are carried in the front crankcase cover, and these accessories themselves are spigot-mounted on that cover. All these gears are bevels.

Induction System.—One Zenith carburettor, type 65 G, delivers mixture to induction-chamber formed in back crankcase cover. In this chamber is a fan impeller driven by a tail shaft from the end of the crankshaft. Mixture from the fan passes through five radial pipes to the inlet valves.

Lubrication.—Two gear pumps, one suction and one scavenger, contained in one casing are carried below the front crankcase cover.

Ignition.—Two Watford C.5 magnetos.

Airscrew Drive.—Direct, with parallel spline drive to hub.

Overall Dimensions.—Diameter 45 in. (1.16 m.), Length 32.6 in. (0.827 m.).

Output.—Normal 125 h.p. at 1,620 r.p.m., Maximum 138 h.p. at 1,780 r.p.m.

Weight.—340 lbs. (155 kg.).

Fuel and Oil Consumption.—Fuel .575 pints = .55 lbs. (.25 kg.) per h.p. hour, Oil 2 pints (1.1 litres) per hour = .02 lbs. (.009 kg.) per h.p. hour.

The B.M.W. VA Engine.

Made by The Bayerische Motoren-Werke, Munich. (A six-cylinder vertical water-cooled engine for general purposes.)

Cylinders.—160 m/m. bore x 190 m/m. stroke. Steel barrels with separate welded sheet steel jackets. Two inclined overhead valves per cylinder.

Compression Ratio.—5.5 or 6 to 1.

Valve Gear.—Single overhead camshaft, operating valves through rockers. Totally enclosed except for tappet fingers.

Pistons.—Aluminium alloy castings.

Connecting Rods.—Channel section steel. White metal big-ends.

Crankshaft.—Carried in 7 plain bearings (white metal).

Crankcase.—Aluminium alloy casting, split on crankshaft axis, with deep sump at back end.

Auxiliary Gears.—All carried at rear of crankcase. Camshaft driven through vertical shaft and bevel gears. Magnetos driven by two horizontal shafts above crankshaft. Drives for two A.M. fuel pumps below crankshaft.

Magnetos.—Two Bosch G.F.6 magnetos.

Carburettors.—Two vertical Zenith carburettors each feeding three cylinders through manifolds connected by equaliser tubes.

Lubrication.—Normal dry sump type with plunger pressure and rotary scavenger pumps.

Starting Gear.—A distributor for compressed air starting is fitted.

Airscrew Drive.—Direct. A flange mounting without spigot is provided at front end of crankshaft.

Overall Dimensions.—Length 1.668 m. (5 ft. 5½ in.), Width 0.635 (2 ft. 1 in.), Height 1.133 m. (3 ft. 8½ in.).

Output.—Normal 320 b.h.p. at 1,580 r.p.m., Max. 360 b.h.p. at 1, r.p.m. (5.5 compression) or 380 b.h.p. at 1,650 r.p.m. (6.0 com pression).

Fuel Consumption.—.225 kg. (.485 lbs.) fuel and .01 kg. (.022 lbs.) per b.h.p. hour.

Weight.—Dry 317 kg. (698 lbs.), Weight per h.p. 0.99 kg. (2.18 lb per h.p.

The Cameron Radial.

Made by The National Aero Corporation, 1123, Broadway, New Yo City, U.S.A. (Seven-cylinder air-cooled radial.)

Cylinders.—4⅛ in. (105 m/m.) bore x 4½ in. (114 mm.) stroke. All steel castings, with integral heads. Two inlet and two exha valves, with stems at right angles to cylinder bore, are arran one pair on each side of a rectangular section pocket in cylin head. Inlet valves are in detachable cages.

Compression Ratio.—5.4 or 6 to 1.

Valve Gear.—Valves operated by shafts parallel to cylinder a having a rocker lever at upper end. This actuates a sli carried on guides from the cylinder head and the slider ma contact with the valve stems.

Pistons.—No data.

Connecting Rods.—Duralumin forgings. Claims are made that articulated rod assembly is a marked improvement on existi standard types but details are not given.

Crankshaft.—Nickel-chrome steel, one piece. Runs in Hoffman roll bearings with one deep groove ball-thrust race.

Crankrace.—Light alloy casting, nearly cylindrical. No details internal arrangements, method of securing cylinders, etc., give

Auxiliary Gears.—All carried in rear of crankcase. No data ava able.

Carburettor.—One carburettor carried at back of engine, dischar mixture to a cylindrical induction chamber in rear crankcase cov Seven radial pipes deliver mixture to cylinders.

Ignition.—Twin distributors and contact breakers for battery igniti fitted. One plug fitted in each end of rectangular head pocket each cylinder.

Starting Gear.—A mounting flange is provided at the back of engine to take any standard inertia, air or electric starter.

Airscrew Drive.—Direct. Airscrew hub mounted on straight ta and driven by one key.

Overall Dimensions.—Diameter 33 inches (0.837 m.), Length ove 26 inches (0.660 m.).

Output.—100 b.h.p. at 1,800 r.p.m.

Weight.—280 lbs. (127 kg.).

NEW AIRCRAFT ACCESSORIES.

Edo Standard Floats.

The Edo Aircraft Corporation, of College Point, Long Island, N.Y., have developed types of standardised all-metal floats suitable for fitting to the majority of the popular American types of small civil aircraft. These Edo floats are of the long single-step type with Vee bottoms, flat decks and tumble-home sides which run into the deck through a fairly large radius. The lines are well shown in a drawing reproduced. The flat deck is claimed as having special virtue in giving a good foothold for embarking passengers.

The floats are built on frames spaced some 24 inches apart, tied together by light stringers broken at the frames, and depend mainly on the skin plating for their strength. They are jig-erected to ensure complete similarity of form. None of the plating requires forming, and all bends in frame members are of uniform radius. The float is thus simple and cheap to produce.

All joints in the skin are metal to metal, watertightness being secured by close pitching of rivets and accuracy of manufacture.

Completely assembled floats are placed in an anodic bath, and are then given a coat of red oxide primer paint and two coats of pigmented Lionol outside.

The particular size of float shown in the drawing is intended for three-seater machines such as are fitted with OX 5 engines. These machines range in total weight from 2,000 to 2,400 lbs. The submerged buoyancy of this size of float is 2,450 lbs. per float, giving a reserve buoyancy per pair of from 105% to 145% for these machin

"Edo All-Metal Seaplane Floats." *By B. V. Korvin-Kroukovs*
(*Aero Digest, Jan.*, 1928.)

The Fairchild Ski-Floats.

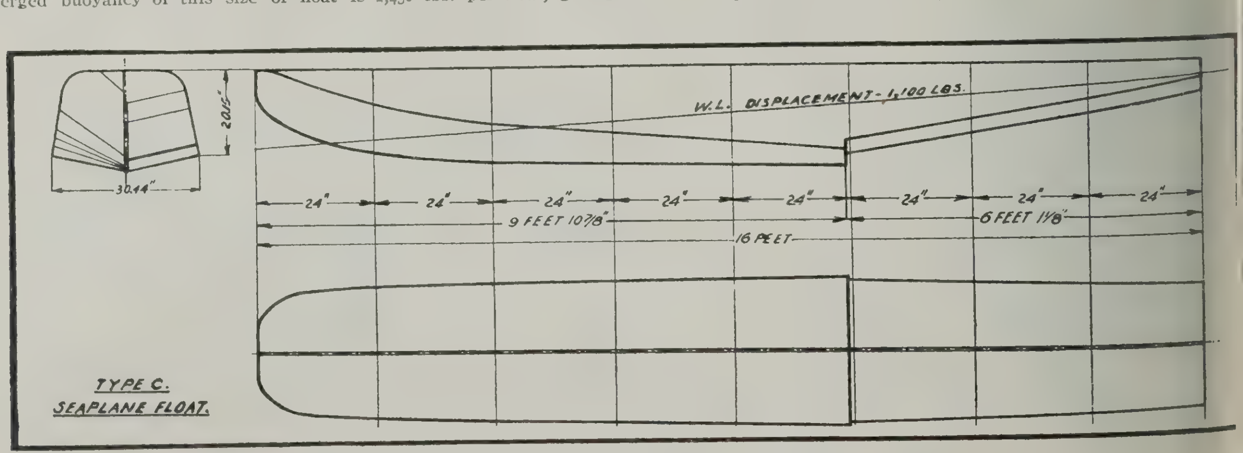
The Fairchild Airplane Manufacturing Corporation have recen built for the Canadian Trans-continental Airways of Quebec two F child cabin monoplanes fitted with floats designed to work from eit water or from snow or ice-covered surfaces without change of un carriage.

To this end they have been fitted with special floats. These fl externally are of normal shape except that the usual V bottom been cut off flat. The section has, that is, a narrow, flat bottom then on each side of that flat, one half of a cut-down V.

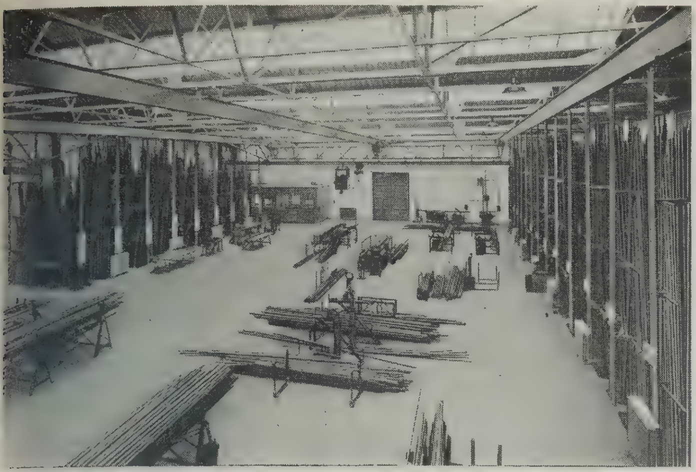
This flat bottom is actually a ski, pivoted near the nose of the f and partly recessed into a rectangular channel in the bottom of water-tight float body. At its rear end—which is also part of the of the float—the ski is supported by two sets of compression rub buffers which pass up into a water-tight well built into the f proper.

No details are available as to the travel allowed the ski be the edge of the fixed section of the float fouls the snow or ice.

The floats are necessarily larger and heavier than normal fl for a similar sized machine, but they are reported to have gi satisfactory results in service. (*Aero Digest, Feb.*, 1828.)



A typical Edo Float for small civil aircraft.



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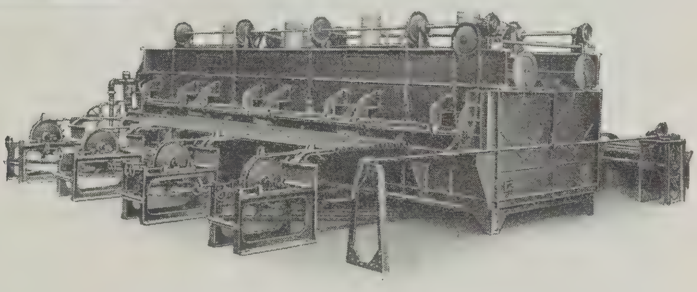

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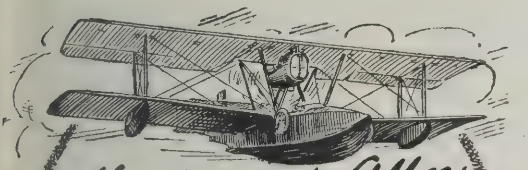

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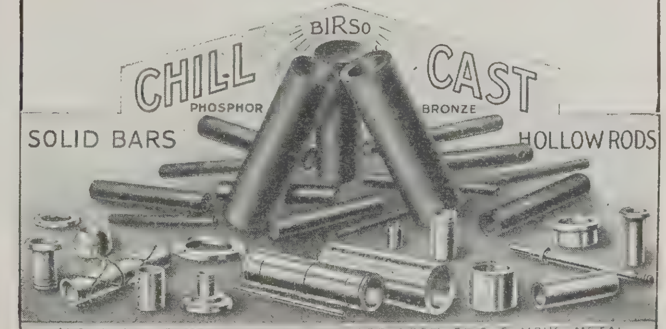
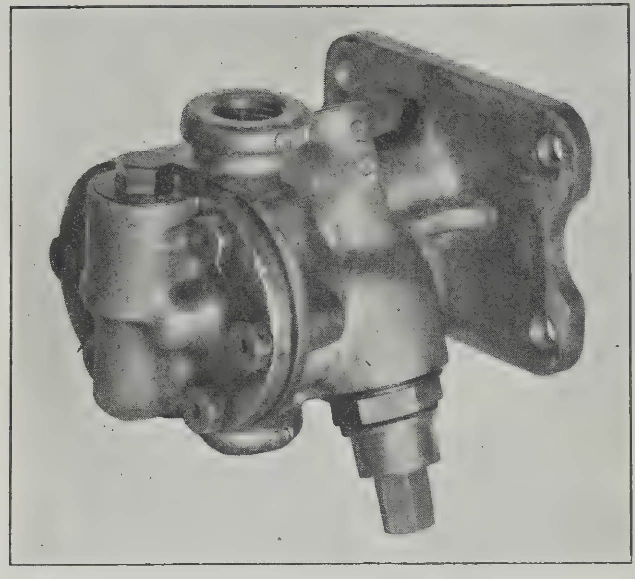


AND A FEW FINISHED PRODUCTS MADE FROM THIS FAMOUS METAL.

The Pioneer Engine-Driven Fuel Pump.



An illustration is given of a petrol pump made by the Pioneer Instrument Company, of Brooklyn, New York. A large number of these pumps have been used by the U.S. Naval Air Service. The pump is arranged for direct mounting on the engine whereve suitable drive is available, and the necessary relief valve is bu into the unit.

The combined unit weighs 2.75 lbs. (1.25 kg.) and has a deliv capacity of 85 Imperial gallons (387 litres) per hour at 1,800 r.p.m

The Vickers-Potts Oil Cooler.

A standardised segmental oil cooler suitable for use with practi every type of aero-engine and on any type of aircraft. Made supplied by Vickers Ltd. (Aviation Dept.), Vickers House, Broad London, S.W.1.

The cooling elements consist of hollow fins through which t oil from the engine passes on its return to the oil tank. The fo of these fins constrains the oil to flow through them in a th layer. The walls of each fin are tied together by rivets passi through distance pieces and these obstructions cause the oil flow be turbulent. Thus cold oil is kept from congealing on the wa while hot oil flows uncooled between the congealed layers.

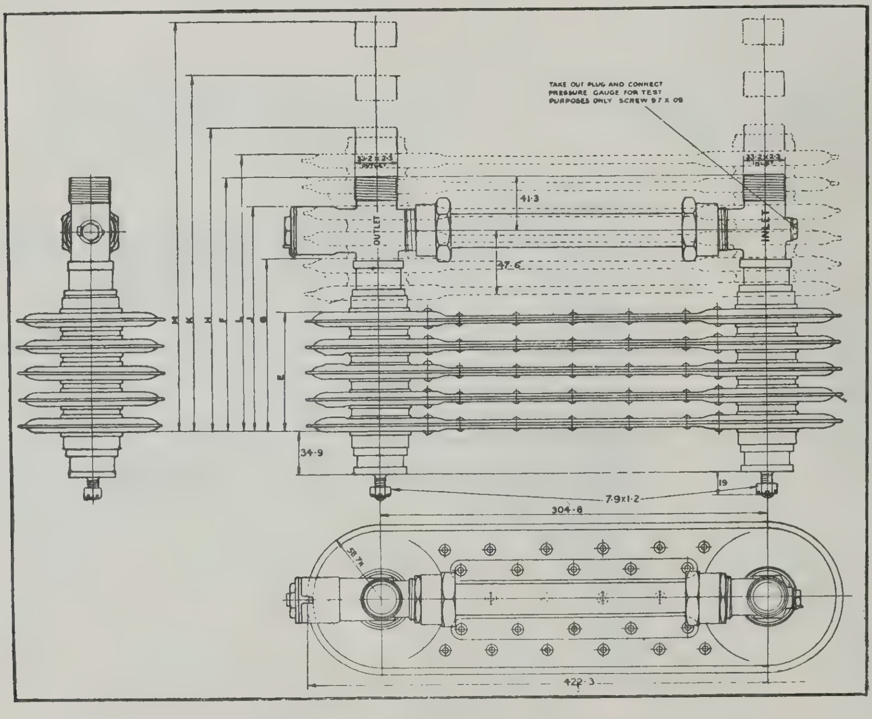
All cooling elements or fins are of standard dimensions. T requisite number of fins for a particular case are threaded on to t tubes, which serve as supports and also for communication betwe fins. The arrangement is such that the oil flows in series throu all the fins.

The complete cooling unit is mounted preferably in the slip-stre with the fins edge-on to the air flow.

The cooling surface per fin is 145 sq. in. (930 sq. cm.), and stand coolers are made with 5, 7, 9, or 11 fins, a range suitable for engi from 250 to 800 h.p. in normal aircraft.

The weights and the h.p. absorbed in overcoming the drag 100 m.p.h. of these coolers are:—5-fin unit, 9.75 lbs. (4.4 kg.) and h.p.; 7-fin unit, 11.75 lbs. (5.3 kg.) and 1.46 h.p.; 9-fin unit, 14 l (6.35 kg.) and 1.79 h.p.; 11-fin unit, 16.5 lbs. (7.5 kg.) and 2.1 h.p.

The general arrangement of this cooler is shown in an illustrati


TAKE OUT PLUG AND CONNECT PRESSURE GAUGE FOR TEST PURPOSES ONLY SCREW 9.7 X 0.9
OUTLET
INLET
41·3
37·6
34·9
19
7·9x1·2
304·8
58.7R
422·3
E

INSTALLATION DRAWING OF TH
VICKERS-POTTS OIL COOLER.

The dimensions indicated by letters the drawing are:—

5 Fin Cooler E = 90.5, F = 193.7.

7 Fin Cooler G = 131.0, H = 234.2.

9 Fin Cooler J = 171.5, K = 274.6.

11 Fin Cooler L = 211.9, M = 315.1.

All dimensions are in millimetres. is only necessary that the fins the selves shall be in free air, so that projection of the cooler outside the bo will only slightly exceed the first of t two dimensions given for each size cooler.

TECHNICAL ABSTRACTS.

Aerodynamics.

"Thirteenth Annual Report of the National Advisory Committee for Aeronautics, 1927" (U.S.A.). (See also New Technical Literature.)

Among many items of interest mentioned in this report the following seem to be of major interest in regard to aerodynamics.

Boundary Layer Control.—" A large number of pressure distribution tests have been made on a U.S.A. 27 aerofoil fitted with various types of combinations of slots through which air has been blown or sucked for the purpose of controlling the boundary layer. The results . . . . have shown that the power required by an aeroplane may be reduced by the use of suitable slots in the wings. Removal of the boundary layer by suction has proved . . . . more economical than the acceleration of the boundary layer by pressure." (Page 23.)

On a later page (26) it is stated that full-scale flying tests have been made on a biplane whose upper wing was slotted, by blowing away the boundary layer by air jets supplied by a Roots type supercharger. These tests indicate that this method of removing the boundary layer has little chance of success. Further tests, including the removal of the boundary layer by suction, are contemplated.

Airscrew research.—To overcome the difficulties of applying mo results to full-size airscrews, a special wind tunnel has been c pleted at the Langley Memorial Aeronautical Laboratory. This tun is of the open-jet type, 20 ft. in diameter at the jet, and a f sized aeroplane fuselage, engine, and airscrew can be mounted ther An air speed of 110 m.p.h. at the jet is produced by an eight bla fan 28 ft. in diameter driven by two 1,000 h.p. Diesel engines.

For the study of the characteristics of aerofoils used in airscr at high tip speeds, an ultra-high-speed wind tunnel of small has been installed at the laboratory of the Bureau of Standards. T provides an air stream two inches diameter of a speed variable tween 0.5 and 1.08 times the speed of sound (375 to 825 m.p. Characteristics of 24 aerofoil sections have been measured at speeds in this range. These aerofoils are all of types commo used for airscrew purposes. The results indicate the desirability using sections having their maximum ordinates far back for spe of this order.

Air Loads on Aircraft.—Data of loads and stresses collected flights of the airship *Los Angeles* have been analysed and tabulat The results show conclusively that loads caused by flying in ro

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R.A.F. Photograph. Crown Copyright Reserved.

air greatly exceed those caused by any possible manœuvres of the ship. (Page 25.)

The greater part of the flying tests on aeroplanes made at the Langley Memorial Laboratory during 1927 have been devoted to measurements bearing on the distribution of air loads on machines in violent manœuvre. Pressure distribution and acceleration measurements have been made on a modern pursuit machine, giving pressures over the whole of the wings and tail and accelerations at wing-tips, rear end of fuselage, and C.G. of machine. Investigation of the results is not yet complete. In certain tests of this type a load factor of 11½ was reached in flight. (Page 25.)

Spinning.—Investigation of dangerous conditions of spinning flight have been continued by the "dropping model" method. For these tests flying models correct to scale and in respect to loading and mass distribution are dropped in a spin and their motions recorded by an ultra-rapid cinematograph camera. So far only the effects of mass distribution have been studied but the tests show that the type of spin produced—"flat" or "normal" can be controlled by mass distribution alone. To supplement the information obtained from these models the full-scale moments of inertia of a number of aeroplanes—specially those which have dangerous spinning characteristics—have been measured. (Page 26.)

Air Traffic.

"Der Deutsche Luftverkehr, 1927" (German Air Traffic, 1927). Nachrichten fur Luftfahrer, Dec. 8 and 15, 1927.

Continuation of tabulated details of German Air Traffic for months April and May, 1927. (See *Aeronautical Engineering*, Jan. 25, 1928, page 110, for January, February and March statistics.)

In April the numbers and total length of routes increased from 23 routes and 7,841 km. (4,860 miles), operated Jan. 1 to April 16, to 54 routes and 19,893 km. (12,300 miles) operated from April 18 to April 30.

The total figures of traffic for this month are:—1,827 flights scheduled, 1,590 completed; 19,274 seats available (for one stage), 7,608 filled; 617,911 km. (383,000 miles) flown; 1,464,737 passenger km. (907,000 passenger miles); 122,293 kg. (120 tons) and 26,399 ton kilometres (16,100 ton miles) of goods; 29,234 kg. (29 tons) and 5,170 ton kilometres (3,160 ton miles) of mails.

During May the number of routes became 68, with an unstated route length. The traffic statistics for this month are:—3,295 journeys scheduled, 3,332 (including 77 specials) completed; 36,237 seats available (for one stage), 16,885 filled; 1,214,558 km. (755,000 m.) flown; 3,089,744 passenger kilometres (1,940,000 passenger miles); 302,956 kg. (298 tons) and 68,512 ton kilometres (41,800 ton miles) of goods; 86,615 kg. (85 tons) and 16,485 ton kilometres (10,000 ton miles) of mails.

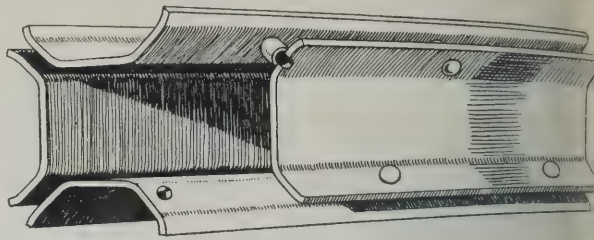
Steel Construction for Aircraft.

"The Martin 'Eureka' Section." By L. C. Milburn. Aviation, Feb. 6, 1928.

According to this article the engineering staff of the Glenn L. Martin Co. have for some years been dissatisfied with existing methods of aircraft construction. "Stick and wire" construction had already passed away, replaced by welded steel tubing, but they were beginning to doubt the adaptability of this type of structure for production on a large scale. Uncertainties of inspection, difficulties of securing interchangeability, the need for highly-specialised labour, and the interruption to production caused by the spoiling of any part of an important assembly are serious drawbacks.

The faults of existing types of construction appeared most prominently in connection with joints and fastenings, and therefore the problem of jointing was selected as a key to the development of better methods.

Light alloys are regarded as unsatisfactory material for aircraft mainly because of the practical difficulties of producing these alloys in the required grades and worked to the required sections, a difficulty that would be increased immensely if a sudden vast crease in the demand arose—from, say, military reasons.



The Glenn L. Martin Co. have therefore set to work to evolve ty of steel structural members, built up from formed sheet secti rivetted together. The only section described in the article is designed for service as a compression member known as the Eur section.

This is an assembly of four strips drawn or rolled to a trou section. The edges or lips of the troughs are inclined to the at an angle of 135°. In the assembled position the bases of the f troughs lie on the sides of a square, with the eight lips form double thickness ledges projecting diagonally from the corners the square so formed. The two lips forming each of these ledges separated apparently at short intervals by distance pieces, and assembly is completed by rivetting through lips and distance piece

Except at the distance pieces therefore there are slots right thro both diagonals of the assembled member. These slots serve for insertion of flat plate fittings which can be rivetted to the lips serve to join other members to the Eureka section.

It is claimed that for its specific purpose the Eureka section g a better strength-weight ratio than any circular section tube.

From illustrations published with this article it is apparent the Glenn L. Martin Co. have also produced structural members aircraft construction drawn to corrugated sections from thin tensile steel, and heat treated after drawing. No description of t sections is however given.

(This new development is of great interest. Hitherto only in Bri has the subject of developing a form of steel-construction other that using solid-drawn tubes, received serious attention, and i probable that if American aircraft constructors really tackle problems of steel construction in earnest progress in this cou will be accelerated.—ED.)

Slip Stream Effect.

"Slip Stream Effect." By Dr. Michael Watter. Aero Digest (York), Feb. 28, 1928.

An attempt to present a simple physical picture of the effec slip stream on the performance of aeroplanes in a form useful performance calculations. The slip stream effect is regarded composed of two separate effects:—(1) Increase of drag of part the aeroplane in the slip stream caused by the higher velocity air flow within that stream and (2) modification of airscrew cha teristic caused by changes in flow of the slip stream imposed by presence of parts of the aeroplane

The author refers to a number of well-known authorities and proposals for dealing with these effects and compares these posals one with another. He arrives at the conclusion the two effects (1) and (2) may each be evaluated in terms of a si empirical formula depending upon two coefficients for effect (1) one coefficient for effect (2) and that average values of all these efficients derived from experimental tests can safely be used for d purposes.

Various tables and curves are reproduced to justify the clusions and to aid in the choice of suitable values for the nece coefficients for particular cases.

NEW TECHNICAL LITERATURE.

Aeronautics (General).

"Thirteenth Annual Report of the National Advisory Committee for Aeronautics, 1927." The United States Government Printing Office, Washington.

This volume is the American equivalent of the annual administrative report published by the British Aeronautical Research Committee, and consists of a general survey of work done in the year under review without entering into the detailed results of that work, which are published separately.

This administrative report describes the organisation of the N.A.C.A., outlines its general activities and shows precisely what its relations are with other aeronautical concerns, such, for instance, as the U.S. Army and Navy Air Forces, the Aircraft Industry, and various educational establishments and so forth.

It further gives reports from the Technical Sub-Committees which actually control the experimental work under the N.A.C.A. concerning their specific work. This work includes such diverse matters as wind tunnel experiment to various ends, flying tests on aeroplanes and on models of aeroplanes, researches into the phenomena of combustion in the internal combustion engine, the qualities of materials and so forth.

The whole report shows that the experimental aeronautical activities of the N.A.C.A. are on a much more lavish scale than those publicly announced by the corresponding body in this country.

A good deal of interesting technical information con be gleaned from these administrative reports, and some items so gathered are recorded in the Technical Abstracts published in this issue of Aeronautical Engineering.

Air Surveying.

"The Stereoscopic Examination of Air Photographs. By Lieut. M. Hotine, R.E. (Professional Papers of the Air Survey Committee, No. 4.) H.M. Stationery Office, 3s. 6d. net.

This work is essentially a study of the principles of stereoscopic vision, and of the meaning which can be attached to the appearance of relief given by such vision, and of the application of principles to the interpretation of the images formed by stereos examination of overlapping aerial photographs by the map-m The actual subject is of too special a nature to consider here, the book is confidently recommended to all students of surveying.

Journals.

"Notizario Technico Di Aeronautica," January, 1928. The Mi of Aeronautics, Rome.

Contains the first instalment of an article by Ing. A. Levi- on the problem of the development of the heavy oil engine for nautical purposes, with special reference to the problems of bustion and of fuel injection.

The remainder of the issue contains translations into Italian *"Eine Näherungslösung des Problems der Wirtschaftliche Luftsc ben"* (An Approximate Solution of the Problem of the Econo Airscrew), by H. B. Hembold (*Z.F.M. No. 1, 1927*); *"Fallschirm Luftfahrzeug"* (Parachutes for Aircraft), by W. Muller (*Z.F.M. No* *"Zur Flugmeteorologie von Nordatlantische Ozean"* (On Aeronautic Aspects of the Meteorology of the North Atlantic H. Seilkopf (*Luftfahrt, Sept. 7, 1927*); *"The Friction of Ai Engines,"* by S. Sparrow and M. A. Thorne (*N.A.C.A. Report* *"The Internal Combustion Engine and its Influence on Material,"* by G. W. Phillips (*Journal R.U.S.I., November,* 1927) an article by Von Karman and Seewald on the theory of viscous (Abhandlung Aus den Aerodynamischen Institut Aachen, Vol.

"The Journal of the Royal Aeronautical Society." No. 206, Vol. X Feb., 1928.

Contains notices concerning the Society, Paper on "The Use Wind Channel for Performance Prediction," by R. K. Pierson discussion), and "Abstracts and Notices from the Scientific Technical Press, No. 5."

(*Continued from page 276.*)

he approximate distance according to the above figures 12,270 miles.

he regularity of the flight is remarkable. With the ex- tion of one day at Ramleh and one at Darwin, at which er place he overhauled his engine, he flew every day, ing at the crack of dawn and putting in a daily average 650-700 miles. By leaving at dawn and arriving at the t stopping place early in the afternoon he was able to ote what little time was needed to going over his hine and engine before turning-in in preparation for the t day's flight.

THE ARRIVAL IN AUSTRALIA.

s already mentioned, Hinkler landed at Darwin at 17.55 (Australian time) from Bima, Dutch East Indies. He left Bima without breakfast, and, owing to mosquitos, hout any night's rest, at dawn. The journey of 900 miles uded a sea-crossing of 420 miles. Good weather pre- ed all the way, and at 17.45 hrs. he sighted the coast flew straight to the landing ground at Fanny Bay, five es from Darwin.

fter examination by the Government Medical Officer and Customs officials he was welcomed by the Government ident and the entire population of Darwin. He then eeded to the Victoria Hotel, where he was handed a containing 476 telegrams of congratulation. He was r entertained to dinner by the local civic authorities and Returned Soldiers' Association. The following day he it in overhauling his engine and machine in preparation his flight across Australia.

n Feb. 24 he left Darwin for Camooweal. After flying two hours he passed over Katherine and then turned the desert. With a strong head wind and a burning he was forced to land after five hours near a windmill, -way between Brunette and Alexandria. Here he shel- d for the night, and next morning continued to Alexan- , where he was given breakfast. He then continued to kine, where he landed, and then proceeded to Camoo- l. Here he was given a great reception by the towns- ple.

n Feb. 26 he flew from Camooweal to Longreach, land- at Cloncurry, McKinlay and Winton *en route*. He was rted by an aeroplane belonging to the Quantas Com- y and one which had been sent out by the Shell Com- y to search for him when he had been reported missing previous day. He was given a great welcome by a vd which had assembled from all parts of Western ensland to receive him.

n Feb. 27 he flew from Longreach to Bundaberg, landing ront of his mother's house. A fleet of escorting aircraft mpanied him on the last stage of the flight, and when were seen approaching Bundaberg the assembled bands ck up "See the Conquering Hero Comes," thousands voices taking up the strain. A guard of military and ce, assisted by 200 civilians, helped to keep the crowd r of the landing-ground.

civic welcome followed, during which Col. Brinsmead, Controller of Civil Aviation, delivered a speech of wel- e on behalf of the Federal Government. He was later ented with a cheque for £500, subscribed in his honour the people of Queensland.

n Feb. 24 Mr. Bruce, the Prime Minister, announced in House of Representatives at Canberra that the Govern- t had invited Mr. Hinkler to visit Canberra. On his val he would be asked to accept a cheque for £2,000 and uitable memento of his flight.

nce his arrival in Australia Hinkler has received a iber of offers by cinema and other companies who are desirous of exploiting his name regardless of good taste.

CONGRATULATIONS.

H.M. the King sent the following telegram to Lord Stonehaven, the Governor-General :—

> Please convey to Mr. Hinkler the expression of my warmest congratulations on his splendid achievement. I have been following with the keenest interest the progress of the flight. I am delighted that he has been successful.

Sir Samuel Hoare, Secretary for Air, has sent the following telegram of congratulation to Mr. Hinkler :—

> On behalf of the Air Council, I send you warm congratulations on the record-breaking achievement which you have accomplished on an Avro-Avian, with Cirrus engines. Your flight from London to Australia in fifteen days' flying, unaccompanied and in a light aeroplane, is one further proof of what British pilots in British aircraft can do to link the Empire by air.

The following telegram was sent to Mr. Hinkler on behalf of the Royal Aeronautical Society :—

> Council Royal Aeronautical Society congratulate you most heartily on your magnificent and courageous flight.—SEMPILL, President.

The Royal Aero Club sent first of all a telegram with the simple message "Bravo!" Later Lord Thomson (Chairman of the Club) sent the following telegram to the Prime Minister of Australia at Melbourne :—

> On behalf of the members of the Royal Aero Club please accept warmest congratulations upon safe arrival of your great Australian airman, Hinkler, whose magnificent flight from Mother Country to Australia consitutes a unique performance and will stimulate the development of Empire air communications which we all desire.—THOMSON, Chairman.

As is only to be expected, A. V. Roe and Co. Ltd. have been inundated with congratulatory messages on Mr. Hinkler's achievement. As far as possible, replies have been sent individually, but to those who have sent messages and have not received a reply the Avro company would like to express their thanks through the medium of THE AEROPLANE.

THE EQUIPMENT.

Of those accessories other than the machine and engine that contributes to the success of the flight may be mentioned the Fairey metal airscrew. This airscrew has been fitted to the Avian G-EBOV for over a year, and was used on the London-Riga non-stop flight last year. During the present flight Hinkler flew through the rainy season all the way from Calcutta to the Dutch East Indies under conditions that would certainly have caused trouble with a normal wood airscrew

Palmer tyres were fitted as standard to the machine, and these, as usual, gave absolutely no trouble.

The machine was doped with Titanine. The scheme used is known as the Light Aeroplane Scheme as is standard for practically all light aeroplanes built in this country.

The Avian and the Cirrus engine were completely equipped with Tecalemit greasing equipment, which is now standard on most types of aircraft.

Most of the metal fittings, bolts, nuts, etc., were supplied by Rubery Owen and Co.

The Cirrus engine was fitted with a Claudel-Hobson carburettor, a B.T.H. magneto and K.L.G. plugs, and the regularity of the flight and the absence of any form of engine trouble proves that these accessories performed their duties as one has now come to expect them.

For the flight from London to Darwin Shell Aviation spirit, unmixed with any other ingredient, was used. A telegram received by the Shell company from Hinkler announces that—

> As a precaution lifted cylinders on arrival Port Darwin and amazed excellent condition which no doubt in no small measure is due to using Shell spirit.

Following the precedent set in nearly every great flight, Hinkler used Castrol oil throughout.

THE MACHINE.—The Avro Avian (A.D.C. Cirrus II engine) taken at Croydon immediately before the start of the Australian flight.

THE ROYAL AIR FORCE.

The London Gazette.

Feb. 21.

General Duties Branch.—The following Plt. Offs. are promoted to the rank of Flg. Off. (Jan. 30):—R. K. Hamblin, B. C. Yards, H. H. Martin, H. A. Purvis.

Wing Cdr. J. E. A. Baldwin, D.S.O., O.B.E., is restored to full pay from half-pay (Jan. 16).

The following are transferred to the Reserve, Class A:—Flg. Off. L. M. Timmins (Jan. 19); Plt. Off. R. S. Munday (Feb: 20). Plt. Off. on probation P. C. Miller relinquishes his S.S. comn. on account of ill-health (Feb 22).

Accountant Branch.—Plt. Off. on probation D. A. K. Yiend is confirmed in rank and promoted to the rank of Flg. Off. (Dec. 4, 1927).

Medical Branch.—Flt. Lt. H. Penman, M.B., is granted a perm. comn. in this rank (Feb. 22).

Reserve of Air Force Officers.—General Duties Branch.—W. D. Brookes (Plt. Off., Australian Citizen Air Force) is granted a comn. in Class A as a Plt. Off. on probation (Feb. 21); E. M. S. Spence is granted a comn. in Class A.A. as a Plt. Off. on probation (Feb. 6). The following Plt. Offs. are promoted to the rank of Flg. Off.:—W. A. E. Featherstone (Feb. 9); H. J. Phillips (Feb. 16). Plt. Off. on probation P. S. Clarke is transferred from Class A.A. to Class C (Nov. 26, 1927).

Auxiliary Air Force.—General Duties Branch.—No. 601 County of London (Bombing) Squadron.—The following Plt. Offs. to be Flg. Offs.:—J. J. Parkes (Jan. 13); N. H. Jones (Jan. 21).

Appointments.

Week ending Feb. 27.

General Duties Branch.—Group Captains A. B. Burdett, D.S.O., to No. 21 Group H.Q., West Drayton, to command, 15/2. A. Fletcher, C.M.G., C.B.E., M.C., to Air Ministry, on appointment as Deputy Director of Organisation, 15/2. A. L. Godman, C.M.G., D.S.O., to Electrical and Wireless School, Flowerdown, to command, 25/2. R. P. Ross, D.S.O., A.F.C., A.D.C., to Air Ministry, on appointment as Deputy Director of Manning, 25/2. H. Le M. Brock, D.S.O., to Station H.Q., Hinaidi, pending taking over command, 10/2.

Squadron Leaders G. H. Bowman, D.S.O., M.C., D.F.C., to No. 8 Sqdn., Middle East, 21/1. J. J. Breen, to No. 24 Sqdn., Northolt, 22/2. C. H. Elliott-Smith, A.F.C., to R.A.F. Depot, Uxbridge, 24/1.

Flight Lieutenants G. M. Moore, M.C., to Electrical and Wireless School, Flowerdown, 20/2. P. J. Barnett, M.C., to No. 3 F.T.S., Spittlegate, 21/2. P. M. McSwiny, to No. 1 Air Defence Group H.Q., 2/3. M. B. Mackay, to Station, H.Q., Bircham Newton, 22/2. T. J. Desmond, to School of T.T. (Men), Manston, 26/2. J. B. P. Angel, to Aircraft Depot, India, 24/1. H. E. Falkner, to Aircraft Park, India, 24/1. J. J. Williamson, A.F.C., to Oxford University Air Sqdn., 15/1.

Flying Officers P. A. Moritz, to No. 47 Sqdn., Middle East, 1/2. T. O. Oakes, to R.A.F. Training Base, Leuchars, 1/3. L. H. Anness, to No. 7 Sqdn., Worthy Down, 22/2.

Medical Branch.—Squadron Leader H. S. C. Starkey, O.B.E., M.D., M.A., to H.Q., Coastal Area, 18/3.

Flight Lieutenants C. S. de Segundo, O.B.E., V.D., M.B., B.S., to Superintendent of Reserve, Hendon, 13/3. J. D'I. Rear, to R.A.F. General Hospital, 'Iraq, 21/1.

Flying Officers M. O'Regan, to R.A.F. General Hospital, 'Iraq, 21/1. J. Hill, M.B., to Station H.Q., Hinaidi, 21/1. G. S. Strachan, M.B., to R.A.F. Depot, Uxbridge, 20/2.

Stores Branch.—Squadron Leader A. W. Smith, to Air Ministry, Directorate of Equipment, 1/2.

Flight Lieutenant R. D. G. Macrestie, M.B.E., to Heliopolis Details, 2/2.

Flying Officer A. A. Quayle, to R.A.F. Depot, Uxbridge, 21/2.

Accountant Branch.—Flight Lieutenant H. G. Bushell, to Stati H.Q., Hinaidi, 1/2.

Flying Officers R. T. Carter, to Station H.Q., Hinaidi, 1/2. H. Murton, to No. 13 Sqdn., Andover, 21/2.

The Far East Cruise.

The Service Cruise of the four Supermarine Southampto flying-boats (Napier Lion engines) under the command Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., whic left Cattewater on Oct. 17, left Penang and arrived at Po Swettenham, Selangor, on Feb. 23.

The Flight reached Singapore on Feb. 28.

Vacancies in the Reserve of Air Force Officers.

The Air Ministry announces that a number of openin present themselves now to young men to be trained as pilo in the air force reserve. At least 60 candidates will accepted by the Air Ministry if so many of the right ty are forthcoming.

Applicants must be of good education and physique, but need have had any previous flying experience. They must be over and under 25 years of age. Those judged from their applications be suitable are interviewed by a Selection Committee and th selected, after passing an examination by a medical board, nominated to commissions in the reserve as Pilot Officers on pro tion. The probationary period is 12 months, after which, subj to satisfactory reports, officers are confirmed in rank. Promot to Flying Officer normally takes place after 18 months' service

Commissions are granted in the first place for 5 years, but at end of this period extension may be allowed at the discretion of Air Council, for further periods each of not more than 5 years

Flying training is carried out at Civil Flying Schools at Edgw and Bristol, and consists of a course not exceeding 3 months (pref ably taken continuously) during the first 6 months of service: h solo flying (within a maximum period of 10 days' training) duri the second 6 months; and 12 hours' solo flying (within a maximu period of 20 days' training) in each subsequent period of 12 mont service.

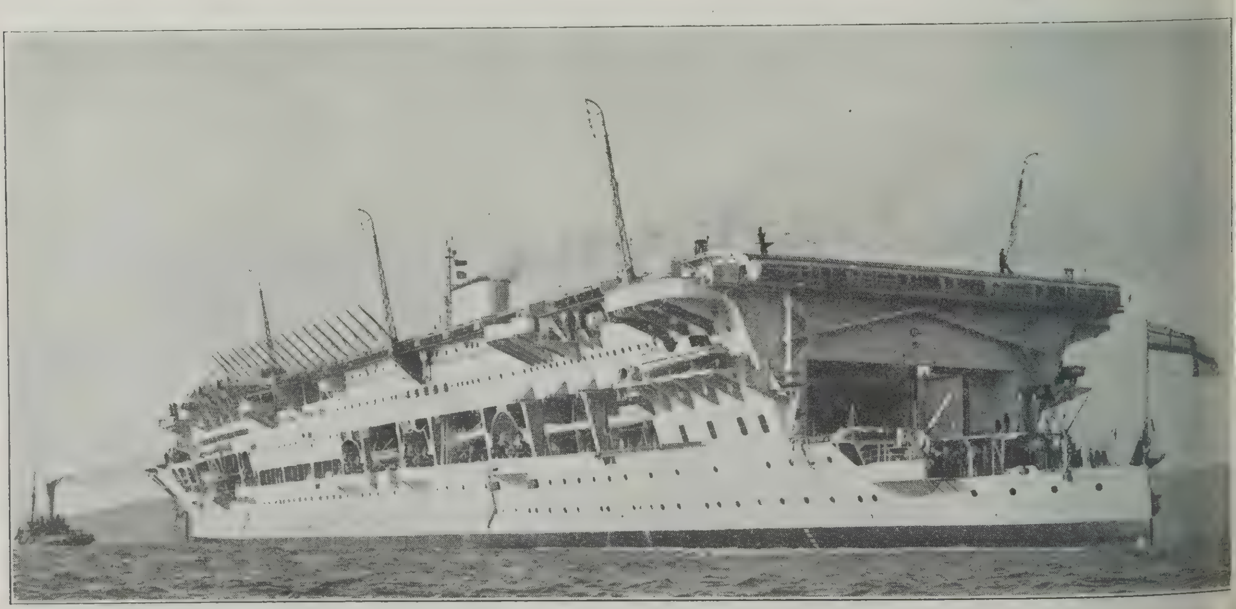
When undergoing training an officer receives, generally speaki the same pay and allowances as an officer of the same rank on active list. The present rates of pay are 15s. a day for pilot offic and 18s. 10d. a day for flying officers. Allowances amount to ab 7s. 9d. a day for officers of these ranks. In addition, an ann retaining fee of £30 is payable, subject to compliance with regulations.

Application forms and further details can be obtained by applyi to the Secretary (S.7.c.), Air Ministry, Adastral House, Kingsw London, W.C.2.

The 1928 Cairo—Cape Town Flight,

The Annual Service flight from Cairo to Cape Town a back which will start on Mar. 1, will be commanded by Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., Air Offic Commanding, R.A.F., Middle East.

The equipment of the Flight will be Fairey III.Fs (Nap Lion engines).



THE NAVY'S LATEST.—H.M.S. "Courageous" leaving Devonport for her steam trials. The aircraft units in this carrier will be under the command of Wing Cdr. R. Leckie, D.S.O., D.S.C., D.F.C.

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LIGHT AEROPLANE

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THE AVRO CIRRUS-AVIAN has the clean lines of the thoroughbred. Its appearance is in keeping with its fine performance, its ability to stay the course, to give magnificent service.

It has given ample and conclusive evidence of its superiority. In the field of achievement it has led the way.

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Special Assessments for Flying Training.

An Air Ministry Order states that the following officers and airmen have been awarded special assessments as shown hereunder on completion of a course of *ab initio* flying training at No. 4 Flying Training School, Abu Sueir, Egypt.

Special Distinction : No. 335314 L-AC. Brooks, W. H., and No. 351794 Cpl Dixon, L. J.

Distinguished Pass : Plt. Off. R. F. Gandy and Plt. Off. H. F. Surén.

H.M.S. Furious.

Admiralty Appointments dated Feb. 23 contain the following announcement: Captain the Hon. A. R. M. Ramsay, D.S.O., to *Furious* in command (April 23)..

Captain Ramsay, D.S.O., was Flag Captain and Chief of Staff in the *Calcutta*, flagship on the America and West Indies station during 1924-26. Since then he has taken the Senior Officers' War Course. Captain Ramsay married in 1919 Princess Victoria Patricia Helen Elizabeth, daughter of H.R.H. the Duke of Connaught and cousin of His Majesty the King.

Group Captain Burdett.

Group Captain A. B. Burdett, D.S.O., whose appointment to Command No. 21 Group, West Drayton, is dated Feb. 15, was born in 1879 at St. Heliers, Jersey, and educated in Germany, France and Italy. He entered The York and Lancaster Regiment from Sandhurst in 1898 and was promoted to the rank of Captain in 1906. He learned to fly on a Bleriot monoplane at Hendon and his R.Ae.C. certificate No. 734 is dated Feb. 10, 1914. He was seconded to the R.F.C. in June, 1914, and appointed Flight Commander in October, 1914, and Squadron Commander in December, 1915. He went overseas on Aug. 13, 1914, as a Flying Officer in No. 2 Squadron, R.F.C. The announcement of his appointment to be a Companion of the Distinguished Service Order appeared in *The London Gazette* of Jan. 1, 1917, for distinguished service in the field. He was four times mentioned in despatches from France during the War. In August, 1919, he was granted a permanent commission in the R.A.F. with the rank of Wing Commander and was promoted to the rank of Group Captain in January, 1921. In December, 1920, he was appointed to command the Inland Area Aircraft Depot, Henlow, and in May, 1922, he was appointed President of the Aeronautical Commission of Guarantee in Germany. In September, 1926, he was appointed Deputy-Director of Organisation at the Air Ministry.

Group Captain Godman.

Group Captain A. L. Godman, C.M.G., D.S.O., whose appointment to command the Electrical and Wireless School, R.A.F., Flowerdown, is dated Feb. 25, was born in 1877 at Appleton-on-Wiske, Yorkshire, and educated at Rugby. He received a commission in The Yorkshire Regiment from the Militia in 1898 and served in the M.I. in the Somaliland Expedition in 1904-5. He was promoted to the rank of Captain in 1906 and went to France with his regiment in 1914. He was appointed Staff Captain in September, 1914, and wounded in action in October, 1914. He was promoted to the rank of Major in August, 1914, and attached to the R.F.C. for Staff duties. He became S.O.1 R.F.C. in November, 1915, and was appointed Brigade-Major in March, 1916, and Brigadier-General, R.A.F., in June, 1918. He resigned his Army Commission on appointme to a permanent commission in the R.A.F. in Aug 1919, with the rank of Wing Commander. He was creat a Companion of the Distinguished Order in June, 1917, a a Companion of the Order of St. Michael and St. George January, 1919. In September, 1919, he was appointed sistant Commandant of the R.A.F. Cadet College, Cranw and in January, 1923, he was posted to H.Q., R.A.F. Ind for Air Staff Duties. In July, 1924, he was appointed to co mand the School of T.T. (Men), Manston, and in Janua 1925, he was appointed Deputy Director of Manning at Air Ministry.

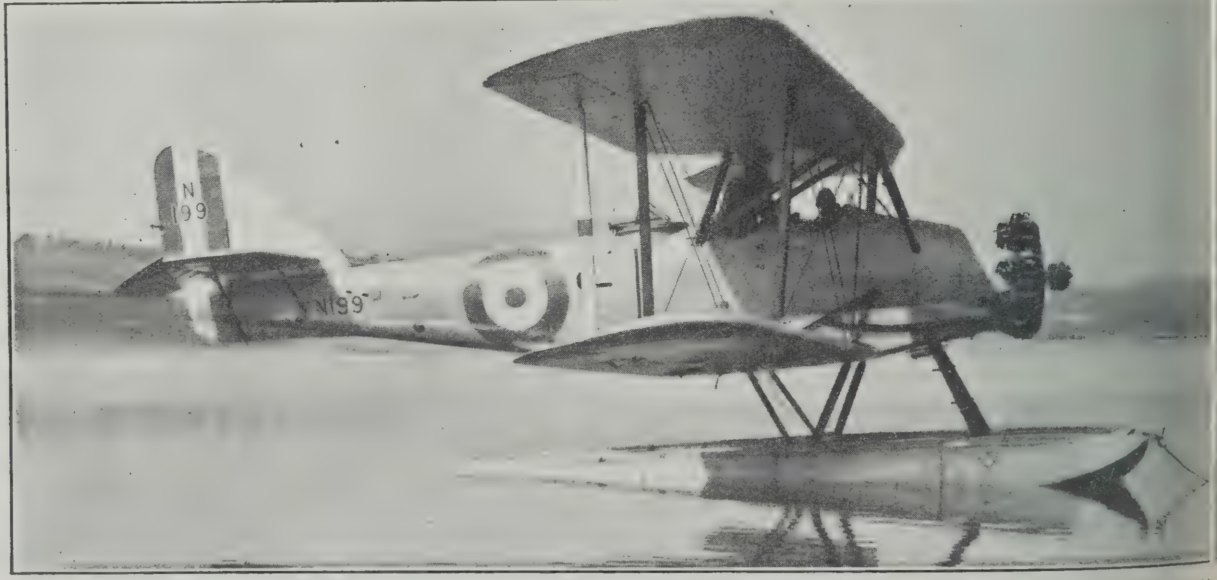
Group Captain Ross.

Group Captain R. Peel Ross, D.S.O., A.F.C., A.D.C., wh appointment as Deputy Director of Manning at the Ministry is dated Feb. 25, was born in 1888, at Fazeley, n Tamworth, Staffordshire, and educated privately and H.M.S. *Britannia*. He was appointed Sub-Lieut., R.N., 1908 and promoted to the rank of Lieutenant in 1910. learned to fly on a Maurice Farman biplane at Upavon his R.Ae.C. certificate No. 422 is dated Feb. 18, 1913. was appointed to the R.F.C. Naval Wing in April, 1913, appointed Flight Lieutenant, R.N.A.S., in July, 1914, Flight Commander, R.N.A.S., in September, 1914, and Squ ron Commander, R.N.A.S., in May, 1915. In 1914 and he served in H.M.S. *Engadine* in the North Sea, dur which period he took part in the raid on Cuxhaven and helmshavn on Christmas Day, 1914. He was mentioned the Director of Air Services, Admiralty, in February, for distinguished service at Heligoland. In October, he was made a Companion of the Distinguished Ser Order for services on patrol duties and submarine search in home waters. From April to September, 1918, he ser with the R.N.A.S. in Italy. He was awarded the Air F Cross in June, 1919, and appointed to a permanent com sion in the R.A.F. in August, 1919, with the rank of W Commander.

After the Armistice he was appointed to command R.A.F. Base at Leuchars. In 1924 he was promoted to rank of Group Captain and appointed to command the E trical and Wireless School, R.A.F., at Flowerdown. was appointed Air A.D.C. to the King on Feb. 1, 1927.

Group Captain H. Le M. Brock.

Group Captain H. le M. Brock, D.S.O., whose app ment to Station H.Q. Hinaidi pending taking over comm is dated Feb. 10, was born in 1889, and educated at Eliza College, Guernsey. He was granted a commission in Royal Guernsey Militia in 1907 and transferred to The R Warwickshire Regiment in 1909. He learned to fly Deperdussin monoplane at Hendon and his Royal Aero certificate No. 551 is dated July 10, 1913. He was seco to the R.F.C. in 1913 and went overseas as a Flying O in No. 5 Squadron in August, 1914. He was promoted to Rank of Captain in The Royal Warwickshire Regiment appointed Flight Commander in the R.F.C. in 1914, eventually rose to Lieut.-Col., commanding a Wing in Field. He was made a Companion of the Distinguished vice Order in January, 1916, for distinguished service in Field. After the Armistice he was appointed to a



THE SHORT STURGEON.—A three-seat all-metal reconnaissance biplane fitted with a Bristol Jupiter engine. It is a convertible landplane, seaplane or amphibian.

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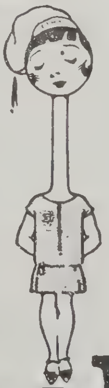

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manent commission in the R.A.F. with the rank of Wing Commander. In 1920 he was in command of No. 1 Group at Kenley and in 1923 he was posted to the Directorate of Training at the Air Ministry. In 1926 he was appointed to command the R.A.F. Station at Kenley and in January, 1928, he was promoted to the rank of Group Captain.

Squadron Leader G. H. Bowman.

Sq. Ldr. G. H. Bowman, D.S.O., M.C., D.F.C., whose appointment to command No 8 (Bombing) Squadron at Aden is dated Jan. 21, was born in 1891 and educated at Haileybury and Trinity College, Cambridge. He was granted a commission in The Royal Warwickshire Regiment in August, 1914, and went to France with his regiment and was wounded in action. He was transferred to the R.F.C. in 1916, and went overseas with a Scout Squadron. In May, 1917, he joined No. 56 Squadron, generally regarded as the crack fighting squadron of the later days of the War, as a Flight Commander, and was awarded the Military Cross in September, 1917, in recognition of gallantry and devotion to duty in the Field and a Bar to the Military Cross in October, 1917, for distinguished service in the Field. In March, 1918, he was made a Companion of the Distinguished Service Order for gallantry and distinguished service in the Field. At the time of the Armistice he was commanding No. 41 Squadron at Halluin. After the Armistice he underwent a course of Naval co-operation at Calshot and was posted to No. 8 Squadron at Hinaidi in 1922. In 1924 he returned to England and joined the staff of No. 5 Flying Training School at Sealand. In December, 1925, he was appointed to H.Q. India while attending a course at the Staff College, Quetta.

The Wahabi Raids in ‘Iraq.

A large force of Wahabis raided ‘Iraq on the morning of Feb. 20 and attacked the Tiyus and the Kosum, two sections of the Jowarin Tribe who were encamped near Jarishan in the valley of Wady el Rumma about 50 miles south-west of Zubeir. A sharp battle took place and the Jowarin lost 300 tribesmen killed and wounded and all their cattle. The Wahabi casualties were estimated at about 60 killed and 200 wounded.

In the evening R.A.F. aeroplanes overtook the raiders and engaged them, inflicting heavy casualties. One machine belonging to No. 55 Squadron was struck by a Wahabi bullet and its pilot, Flg. Off. R. B. H. Jackson, was killed.

Armoured Cars of the R.A.F. left Basrah on the following day in pursuit of the Wahabis. They overtook them and inflicted casualties and took prisoners.

The Basrah correspondent of *The Times* in a message dated Feb. 22 states :—

> The Wahabi Akhwan force which attacked Jowarin tribesmen in ‘Iraq on Monday morning was in three parts—the first under Sheikh Ibn Ashwan, the second under Sheikh Ibn Jebrain, an important Mutair chief, and the third under Sheikh Ibn Hathlein, all being under the supreme command of Sheikh Feisal ed Dowish, the outlaw Wahabi leader.
>
> The first detachment attacked the Kosum, Tiyus, Nabhan, and Rifait sections of the Jowarin tribe, as telegraphed in my message yesterday. The second attacked the Mashaala and Abu Dhair, camped around El Batn, a low-lying region affording water grazing ground. The third deteachment, farther afield, encount two caravans, and here Sheikh Ibn Hathlein violated a centurie Arab custom. The first caravan was composed of a score of ca and 15 men of Sulbi (meaning “People of the Cross”). Arabs n molest Sulbi, saying that they are the descendants of the Crusa and guests in Arabia. Sheikh Ibn Hathlein attacked this, as as the second, caravan, comprising 40 camels, 500 sheep, and a d men. All the men were slaughtered and the animals seized. Sh Ibn Hathlein was about to attack a third caravan, also procee to Zobeir, when Royal Air Force aeroplanes appeared, bombed Akhwan forces, and rescued the caravan.

The Baghdad correspondent of *The Times* in a mess dated Feb. 27 states :—

> The following official account of the recent raids by Wahabi Ak of the Mutair tribe has been received :—
>
> Action taken by the Royal Air Force against the raiders at on Feb. 19.
>
> An Akhwan party, about 2,000 strong, believed to have been by Sheikh Feisal ed Dowish with other Mutairi sheikhs, atta ‘Iraqi and Koweiti tribes encamped near Jarishan, close to Koweiti boundary and 55 miles south of Basra. Bad weather d the three previous days had restricted air reconnaissances, and raiders were thus enabled to reach their objective unobserved. details are yet available as to the losses suffered by the raided t
>
> On the morning of Feb. 19 the raiders were located by air r naissances at a point south of Jarishan, and were attacked as retreated southwards. The attack continued on the 20th and The raiders spread out over a large area, making it difficult to mate their casualties, but it is supposed that the Akhwan lost d these three days at least 50 men killed and a large number of ca
>
> On Feb. 24 aeroplanes located the raiders in two bodies, o miles north-west of Bir es Safah, the other at Bir es Safah which place consists of a fort and a few mud buildings. There large bodies of armed men in both places, with sheep, horses, ca and tents. It appeared that the raiders had assembled with object of distributing the loot still remaining in their hands the previous aerial attacks. The raiders were taken complete surprise; photographs show that the bombing was accurate. bombs were dropped, direct hits being observed on the fort and houses. The remaining bombs were dropped among the men, ca and horses and heavy casualties appear to have been inflicted it is impossible to give exact figures.
>
> The aeroplanes employed in this operation all returned saf ‘Iraqi territory.

In connection with these raids the following statement made by the Secretary of State for the Colonies in House of Commons on Feb. 27 :—

> Since the reply given to the question on this subject asked b hon. Member for Central Southwark (Mr. Day) on Dec. 14 several further raids have been carried out by Akhwan tribes in defiance of Ibn Saud’s authority. On Jan. 22 an Akhwan r party under the leadership of Faisal al Dawish, paramount S of the Mutair, attacked an ‘Iraq tribe some 10 miles within the frontier and inflicted casualties estimated at 75 killed. On Ja Akhwan, numbering some 200, raided into the territory of the S of Koweit. They were subsequently attacked by the forces o Sheikh, and after an engagement, resulting in a certain numl casualties on both sides, their loot was recovered from them. Jan. 29 and 30 this raiding party was located by British aircraf a number of casualties were inflicted.
>
> On Feb. 19 ‘Iraq and Koweit tribes were attacked near Jarish

MIDDLE EAST BOXING CHAMPIONS.—The team which won the Novices’ Boxing Competition in the Middle East Command, R.A.F., No. 4 F.T.S., Abu-Sueir. (Left to right, standing) : Sjt. Alexander, Sjt. Bruty, Plt. Off. S. G. Ubee, AC.1. Hall, L-AC. Damerell, Plt. Off. R. R. Carrol, AC.1. Jacobs, AC.1. Cleall (winner of the welters), Plt. Off. F. W. Murray, Cpl. Henley, L-AC. Larby. (Seated) : Plt. Off. P. G. Atkinson, Plt. Off. M. Glen Sedorski, Wing Cdr. F. K. Haskins, D.S.C., S-M.1. Stollery, Flg. Off. R. L. Bateman, Plt. Off. M. M. Freeman. (On the ground) : L-AC. Fitchie (winner of the bantams) and L-AC. Giblin.

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The Directors of British Airships Limited will be glad to hear from old R.N.A.S. staff in the Airship Section and others interested in Airship development.

All communications should be addressed to the Company, for the attention of Capt. Angus Weir-MacColl, A.F.C., who is the chief pilot of the Company and hopes to take the Company's ship across the Atlantic for demonstration in Canada in the early Autumn.

We cordially invite, at the same time, anyone interested in "Metalised" Materials to call and see the samples of work which can be done by this process.

Enquiries for "Metalised" Materials should be addressed to the Company for the attention of Commander C. P. Franklin, D.S.O., R.N.

British Airships Limited are opening up in, collaboration with another Company, a Flying School and Air Taxi work. Private owners ("B" Licence) are invited to communicate.

All enquiries referring to this section to be sent to the Company, for the attention of Lieut. C. Lincolne Sutton, R.N.

village south-west of Basra, and some 65 miles within the frontier, by an Akhwan raiding party estimated at some 2,300 strong. The losses suffered by these tribes are not yet fully known, but it is believed that more than 50 men were killed, while loss of livestock was heavy. The raid is said to have been led by Faisal al Dawish in person. On the same day three parties of these raiders were located by British aircraft and were attacked with good effect. The aircraft were heavily fired upon and one machine was shot down, the pilot being killed. On Feb. 20 the raiders were again attacked from the air. The casualties inflicted upon them can be only approximately estimated, but it is believed that some 50 men were killed.

Relics and Recollections of No. 6 Squadron.

The Officer Commanding No. 6 (Army Co-operation) Squadron, now stationed at Mosul, 'Iraq, is anxious to get into touch with anyone who served with No. 6 Squadron, R.F.C. and R.A.F., during the War who would be willing to give or lend the Squadron prints of photographs of the Squadron during those days. In the case of loans every care will be taken to return the originals after they have been copied.

Personal reminiscences written by former members of the Squadron would also be greatly appreciated.

Any former member of the Squadron who would like to help in building up an historical record of the war-time work of the Squadron should write to Sq. Ldr. C. Hilton Keith, No. 6 (Army Co-operation) Squadron, R.A.F., Mosul, 'Iraq.

R.A.F. SPORTS AND PASTIMES.

The R.A.F. Athletic Championship.

The R.A.F. Athletic Championships Meeting will be held at Uxbridge on July 11, 12, and 14.

A Challenge Cup has been presented by Air Marshal Sir John Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., for the Air Defence of Great Britain Unit scoring the greatest number of points in the Championship.

Boxing.

The R.A.F. Open Team Championship.

The semi-final of the open team championship between Manston and Henlow was held at Henlow on Feb. 16 and produced a good evening's boxing. Henlow won by 16 points to 12. The results of the match were:—AC. Johnson (Henlow) knocked out AC. Palmer (Manston); L-AC. Williamson (Henlow) beat Cpl. Bunce (Manston); AC. Garrett (Henlow) beat AC. Varley (Manston); L-AC. Buchanan (Manston) beat AC. McGinn (Henlow); L-AC. Wood (Henlow) beat AC. Jones (Manston); AC. Munkley (Henlow) knocked out AC. Christian (Manston). AC. Watt (Henlow) beat L-AC. Deane (Manston).

There were also two special four-round contests, the first between H. R. D. Clarke (ex Bantam-weight Champion of Cambridge University) and L-AC. Maher (Henlow) was a fine exhibition of clever boxing and hard hitting and resulted in a win on points for the airman. The second was a real slogging match between AC. Higgins (Calshot) and AC. Silly (Gosport) in which Higgins was always on top.

The R.A.F. versus the Household Brigade.

The Household Brigade beat the R.A.F. in a match at Chelsea Barracks on Feb. 17 by 21 points to 20. The R.A.F. team were unable to put in many of their best men for this match owing to the difficulty of finding a Guardsman under 9 st. 9 lbs. but the sides agreed upon were one heavyweight, two light-heavies, five middles, four welters and two lights. For the Guardsmen the most outstanding performer was Gdsmn. Beecham who put up a very good fight against AC. Higgins. For the R.A.F. the laurels went to AC. Munkley (Henlow) and AA. Cliff (Halton). Munkley is the most improved boxer in the Service. In 18 days he has scored three light-heavyweight wins. In beating Gdsmn. Hogan he put up a fine show against a very tough opponent and floored his man for 8 in the second round. AA. Cliff boxed in very good style and as he is not yet nineteen he should do well in the future if he continues to improve.

Boxing in the Middle East Command.

The R.A.F. Boxing Association (Middle East) Annual Novices' Competition were held at No. 4 F.T.S., Abu-Sueir, Egypt, on Jan. 27. Ten teams, representing Heliopolis, Aboukir, Helwan, Palestine, Trans-Jordan and Abu-Sueir took part in the meeting. Boxing of a very high standard was witnessed and stamina and sportsmanship were shown by all the competitors particularly in those bouts where good losers were easily outclassed by their opponents.

No. 4 F.T.S. came out on top with 27 points. The placings were as follows:—No. 4 F.T.S., 27; Depot "A," 23; No. 2 Arm. Car Coy., 18; No. 208 Sqdn., 14; Heliopolis "A" to "K," 13; Palestine General Hospital, 8; No. 14 Sqdn., 8; No. 45 Sqdn., 5; Depot "B" 2, 5; Depot "C," 4.

Air Commodore A. G. Board, C.M.G., D.S.O., said that the officers under instruction at No. 4 F.T.S. had put up a very good show in their weights and he hoped that they would continue their boxing and give of their best in the Unit to which they would be posted in future boxing competitions which would demand a higher standard of traini and skill. As an example of what a novice was capable doing he quoted L-AC. Love of Kenley who, last year, w the Sir Charles Wakefield Novices' Competition in his weig the R.A.F. Individual Championship, and finished up appropriating the inter-Services Championship.

Association Football.

R.A.F. Officers versus R.N. and R.M. Officers.—The R.A. Officers were beaten at Portsmouth on Feb. 22 by the R. and R.M. Officers by two goals to one. Although the Force forwards were fast and clever they found the Na defence too strong for them. The Navy scored after eig minutes' play and again shortly after half time. The Force recovered after this and Flt. Lt. Millen scored with low shot. An attempt by Flg. Off. Whyte struck one of goal posts.

Hockey.

R.A.F. versus Middlesex:—The R.A.F. beat Middlesex Orleans Park, Twickenham, on Feb. 22, by three goals two. After ten minutes' play Flg. Off. Vines sent across fine centre but three of the other forwards missed the b Shortly afterwards Vines went down again and had a shot goal himself but the ball hit the post and rebounded Flt. Lt. Hampton to score. In the second half Middle attacked strongly but without scoring, and a little later MacAinsworth scored from a centre by Flt. Lt. Inglis. R. Tydd-Chapman then scored two goals for Middlesex and w fifteen minutes to go Inglis scored for the R.A.F. from a p by Vines.

The Royal Air Force Club.

The Annual General Meeting of the Royal Air Force C will take place at 17.00 hours on Mar. 14.

AIR AFFAIRS IN PARLIAMENT.

THE INVISIBLE RAY.

In the House of Commons on Feb. 22, in reply to a questio Col. Day, the Secretary of State for Air said that the Air Mini was in touch with the latest development of the so-called invisible searchlight but it would not be to the public interest to give a detailed answer.

R.A.F. HOSPITAL ACCOMMODATION.

In the House of Commons on Feb. 22, in reply to a question Col. Woodcock, the Secretary of State for Air said that there 440 beds available in Air Force hospitals in this country. maximum number occupied in any one day last year was 368 and annual average number of beds occupied was 266.

THE AIR ROUTE TO THE CAPE.

In the House of Commons on Feb. 22, Viscount Sandon asked Secretary of State for Air how much time would be saved by ta the route across France, the Mediterranean, the Sahara, Cameroons, and thence to Cape Town, rather than by the East C whether landing grounds could be as suitably and cheaply cre and to what extent as to these points and as to commercial revenue-producing possibilities the two routes would vary?

Sir S. Hoare: On the assumption that my Noble Friend desi comparison between the route which is outlined in his question the normal flying route to Cape Town, the answer is as foll The saving in distance, if my Noble Friend's suggestion adopted, would amount, it is estimated, to about 850 miles, repr ing approximately eight and a half hours' flying time. On the hand, more than three-fourths of the western route would lie foreign territory, of much of which no detailed survey has been The establishment and maintenance of landing grounds and equipment of them with adequate supplies of petrol and oil be very expensive, while in regard to commercial and rev producing possibilties the suggested route appears to compare unfavourably with the normal flying route.

THE AIRSHIPS.

In the House of Commons on Feb. 22, in reply to a questio Mr. Rose, the Secretary of State for Air said that one of the o which the construction of the two new experimental airships he hoped, achieve, would be to indicate the regulations which be necessary for passenger-carrying airships. Until practical perience had been gained by experimental flights it would be mature to lay down general regulations and in the meanti was sufficient to deal with any individual applications which be received for certificates of airworthiness for airships and the requirements which should be fulfilled on their merits.

In reply to a supplementary question, Sir Samuel Hoare sai it was not to be assumed that airships were to be built und regulations and that the public would be invited to take pa in ships which had not been certified under any specific co regulation: each case would be taken on its own merits and n ship would fly without having an airworthy certificate. In to Mr. Hardie, Sir Samuel Hoare said that these certificates be based on experience and technical knowledge.

THE WASHINGTON CIVIL AVIATION CONFERENCE.

In the House of Commons on Feb. 22, in reply to a questi Cdr. Bellairs, the Secretary of State for Air said that h heard unofficially that the U.S. authorities were considering the ing of a civil aviation conference and exhibition at Washingto year but he had received no detailed particulars yet and was aw fuller information.

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A NEW AIRSHIP SCHEME.

Despite the combined efforts of Messrs. Neon and Spanner some people still seem willing to stake money on airship development. At any rate British Airships Ltd., of 21, Northumberland Avenue, London, W.C.2, a company formed as recently as October last, are at present engaged on a scheme for the design of a new kind of airship of the semi-rigid type.

They intend the ship to be of about 1,000,000 cubic feet capacity, giving a gross lift of about 30 tons. It will have a relatively low fineness ratio—the length is to be 385 ft. and the maximum diameter 78 ft. 6 in.

With the special type of construction devised by the firm's engineering staff, a very low structure weight is hoped for and a disposable load of a little over 50 per cent. of the gross lift is expected from this ship when equipped with five engines of a total of 1,500 h.p. This power, they say, will give a maximum speed of 70 m.p.h., and an economical cruising speed of 50 m.p.h.

Moreover the first cost of the ship itself is expected to be very low. They claim that it will be simple and inexpensive to maintain, and in relation to its disposable load very much cheaper to operate than existing types of civil aeroplanes.

The relatively low speed of 50 m.p.h. must prevent such a ship from competing effectively with aeroplanes, but the promoters claim that a ship with the above-mentioned characteristics would have a range—carrying an equal paying load—far in excess of that of any aeroplane. On a 1,000-miles' journey it is estimated that the pay-load would be 5½ tons, and for such a journey the airship, partly because it need make no intermediate stop, and partly because it can fly at night, may and probably will prove to be a speedier transport than the 100 m.p.h. aeroplane.

To this may be added the claim that passenger travel by airship can be made far more comfortable for the passengers than it can in the aeroplane as it exists to-day.

[No explanation is given of what the ship would do if it met a 50 m.p.hr. wind such as is common all over the World at all seasons.—Ed.]

The projected construction presents some rather novel features. Generally it is of the type in which there is a continuous keel-girder running the whole length of the envelope. But in this case the keel is double—that is there are two keel-girders. Along the midship section of the ship these twin girders are horizontal and parallel to each other in plan view. From the ends of the parallel sections two pairs of girders run, forward, upward and together, to meet by the nose of the envelope, and aft, upwards and together, to meet at the stern.

The junctions at bow and stern of the sloping girders are tied together by a cable which runs right through the envelope from end to end. The major portion of this keel framework is within the circular section of the whole ship. Forward the parallel girders are extended outside the general shape of the envelope to form the walls of the cabin. Aft they are also extended, and these extensions carry at their ends two of the ship's power-plants.

The gas space in the envelope is to be divided up into compartments. In the plane of the diaphragms between compartments there will be a system of wiring transmitting the lift loads from the envelope proper to the keel-girders. This bracing takes the form of wires radiating from the keel-girders and running up to the envelope.

The position of two of the engine units has already been described. Two more are to be carried fairly well forward, one at each end of a transverse girder which passes across and is built into the duplex keel-framing. The fifth engine is to be regarded purely as a special reserve for use in emergency. It will normally be carried inside the keel on a protrudable mounting.

From this brief description it will be realised that the project outlined is somewhat novel and if the ship be ultimately built its trials should be interesting.

Metal Plating for Everything.

Another scheme of British Airships Ltd. is a new process of metal-depositing. This process is said to be an electro-chemical one, and therefore is presumably akin to the already-well-known electro-plating process, but it is not confined to depositing on metal or other electrical conductors.

Coatings of metal can be applied to wood, cloth, leather, porcelain, glass, etc., as well as to metals. The adhesion of the coatings so applied appear quite remarkable, though at the present moment no test figures as to the extent of this adhesion on various materials are available.

For ornamental and decorative purposes the process has very obvious uses. Light wooden framings coated with metal, polished and lacquered, will give the appearance of solid metal, at a fraction of the cost. For fittings which must be decorative in the cabins of passenger aircraft the process may be useful.

As a protective coating applied to wooden structures coating of nickel or copper might be effective.

The question whether such a coating can usefully be ployed on wooden stress-bearing members used on airc raises a number of very abstruse problems. It seems possi that such composite members of two materials having s widely different physical characteristics might be uns factory from several points of view.

On the other hand it has obvious possibilities for the c ing of wooden airscrews as a protection both against penetration of moisture and against mechanical damage fr rain or spray, and to some extent in the protection of woo floats. [One is under the impression that electro-deposit of copper on airscrews was tried some years ago, abandoned. In any case metal airscrews seem preferabl Ed.]

The application of a metal coating to fabric may have us British Airships Ltd. feel that this is particularly likely prove to be the case for airship fabric.

The process is interesting, and its commercial devel ment in this country seems worth watching.

SIR ALAN COBHAM'S PROGRESS.

On Feb. 24 Sir Alan Cobham and party on the Short Sin pore (two Rolls-Royce Condor engines) arrived at Mwa at the Southern end of Lake Victoria, thus completing experimental flight for the Colonial Office from Alexan down the Nile to Mwanza, back to Khartum, and then b to Mwanza.

During his stay in Kenya he attended a conference Colonial Governors at Nairobi, where offers of support financial assistance for a regular route were obtained f the Governments of Kenya, Uganda and the Sudan.

The East African Governments are very anxious that Cobham-Blackburn Air Lines Ltd. should extend air vices southward through Tanganyika, Nyasaland, North and Southern Rhodesia to the Union of South Africa.

MOTHS IN THE WEST INDIES.

According to an American source plans are now comp for the operation of an air service between Palm Beach, and Grand Bahama. Two D.H. Moths, which are alre in the West Indies, will be used.

This service has been arranged in connection with Grand Bahama Development Scheme in which a numbe British and American financiers are interested.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: Harold E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Feb. 26.

Flying Time 10 hr. 35 min. *Instruction* 7 hr. 20 min. *Sol* 3 hr. 15 min. *Instruction.—With Mr. F. G. M. Sparks*—Mrs. Fr Messrs. J. A. Murphy, Rich Hayes, J. A. Brewster, E. T. Symm *With Mr. S. L. F. St. Barbe*—Mrs. Fraser, Miss H. Cholmond Messrs. Rich Hayes, C. R. Jones, A. Mason, J. C. M. Watson, E Andrews. *Soloists.*—Messrs. R. Sanders Clark, Rich Hayes, J. J. H N. Jones, A. F. Wallace, H. B. Michelmore.

On Feb. 21 Mr. Rich Hayes, flying solo G-EBMP, alighted on boggy part of the aerodrome, with the result the machine tu completely over and was damaged considerably.

It was unfortunate that during the very fine week-end, fog mist hung about the aerodrome and flying was practically imposs

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Feb. 25.

Flying Time 25 hr. 20 min. *Instruction* 10 hr. 35 min. *Sol* 8 hr. 25 min. *Passenger Flights* 5 hr. 5 min. *Tests* 1 hr. 15 *Instruction.—With Mr. Baker*—Messrs. Cohen, Stern, Benson, Ha Brooking, Tweedale, Meade, Secker, Williams, Michelson, Ru Riley, Goss, Gort, Browning, Wade, Gerrard, Caldecott and *With Mr. Cantrill*—Mr. Davison, Miss Baerlein. *Soloists (under struction).*—Messrs. Hall, Gort, Gerrard, Ruddy and Stern. *Pilo* Messrs. Browning, Caldecott, Meads, Harber, Twemlow, Gatt Williams, Michelson, Leeming, Lacayo, Wade, Goodfellow, Chapr *Passengers.—With Mr. Goodfellow*—Mrs. Richmond, Messrs. Ta Mills, Dyson, Lord, Johnson and Richmond. *With Mr. Cant* Mrs. Williams, Messrs. Gorton, Preston, and Wimmer. *With Baker*—Messrs. Stross and Brooke. *With Mr. Scholes*—Mr. K *With Mr. Meads*—Mr. Griffiths. *With Mr. Twemlow*—Mrs. Twem Mrs. Mortimer, Messrs. Mortimer, Browning and Allott.

There was great rejoicing over Mr. Harry Stern's first s Nearly two years ago, taking off on what should have been his solo flight, he had the misfortune to turn the machine over. S then various strokes of ill-luck, including an operation and a ra slow recovery, have kept him back, but last Sunday saw him sa launched amidst universal congratulations from his fellow-memb

Messrs. Hall and Gort completed their figures of eight and landi the latter also carrying out his height test.

On Tuesday MQ lost a wheel while taxi-ing and badly damag wing. She will be flying again this week.

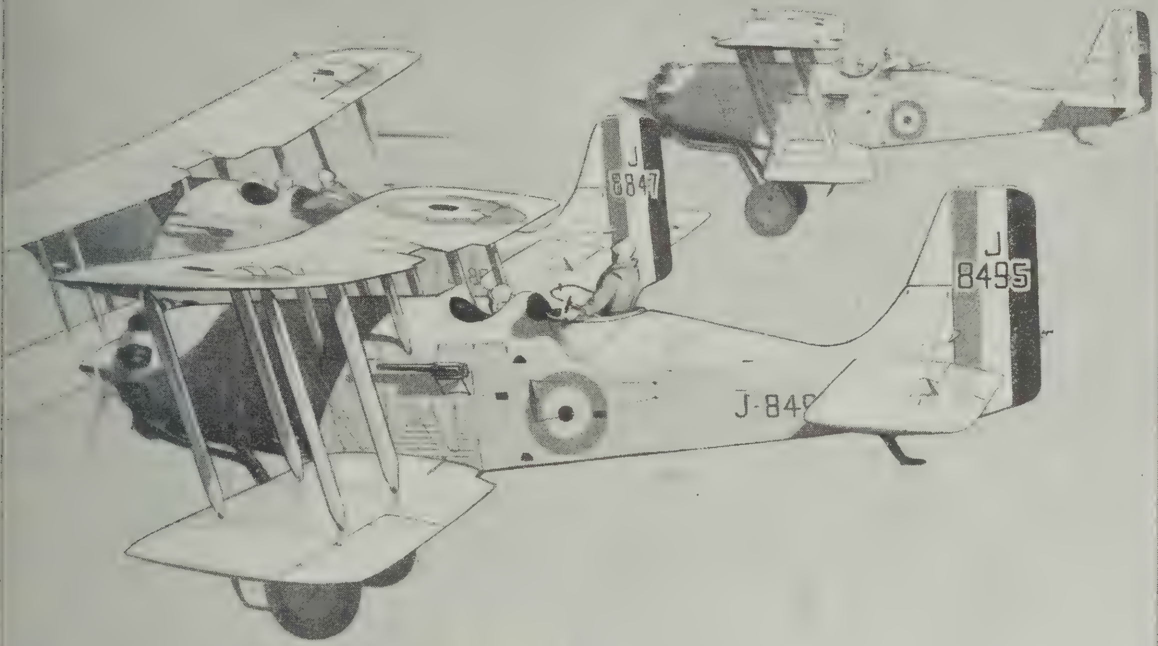
THIS WEEK'S FABLE: "I'm getting very tired of this shine," said a member of the Lancashire Aero Club.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Feb. 26.

Flying Time 27 hr. 40 min. *Instruction* 15 hr. 35 min. *Tests* 55



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Soloists (*Instruction*) 1 hr. 55 min. *"A" Pilots* 8 hr. 20 min. *Passengers* 1 hr. *Instruction.—With Mr. Parkinson*—Miss Rambaut, Messrs. Percy, Griffiths, Runciman, Glenny, J. Bell, Lloyd-Brown, Horn, Maxwell, MacKay, V. Heaton, Mechan, Dr. Alderson. *"A" Pilots.*—Mrs. Heslop, Miss Leathart, Messrs. Turnbull, Wardill, Robertson, H. Ellis, Phillips, R. N. Thompson, C. Thompson, D. Wilson, Dr. Dixon, Mr. A. Bell. The following members carried out first solo flights, all in a very satisfactory manner:—Dr. Alderson, Mr. Mechan and Mr. Percy. *Passenger Flights.—With Mr. Parkinson*—Miss F. J. Ellis. *With Mr. C. Thompson*—Mrs. Heslop. *With Mr. A. Bell*—Mr. J. Bell.

The Landing Competition for the Cup presented by Mrs. J. D. Irving was held on Sunday, in spite of a rather bad haze. Mr. F. Howard Phillips was the winner, and the following pilots took part in addition:—Mr. J. D. Irving, Mrs. Heslop, Miss Leathart, Mr. D. Wilson, Mr. F. L. Turnbull, Mr. C. E. Shaw, Mr. H. Ellis, Dr. H. B. L. Dixon, Mr. C. Thompson, Mr. A. Bell.

A further Competition for the Trophy presented by Flt. Lt. F. Pearce and Flg. Off. Thorn will take place on Mar. 25.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Feb. 25.

Flying Time 5 hr. 10 min. *Instruction* 3 hr. 35 min. *Soloists* 1 hr. 30 min. *Passengers* 5 min. *Instruction.—With Mr. Beck*—Messrs. Ambler, Clayton, Clapham, Ellison, Hepworth, Arthur Senior. *Soloist.*—Mr. Clapham. *"A" Pilots.*—Messrs. Ellison, I. Thomson. *Passenger.—With Mr. Beck*—Mr. Thornton.

Last Sunday the weather was perfect and the bookings complete, but troubles arose in another direction. At 3 o'clock our one and only aeroplane was perched on the cricket pitch in the village of Sherburn, having lost one of its propellor tips.

On Tuesday we still had no machine, and on Wednesday Mr. Clapham went up to remain in the air only 5 minutes before his engine seized. That left us without anything to fly until Friday, when SV was delivered from Brough after undergoing its modifications.

Saturday and to-day, thick fog, so the least said about last week the soonest mended.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending Feb. 25.

Flying Time 16 hr. *Instruction.—With Mr. McDonough*—Messrs. E. Wynn, G. Aldridge, S. G. Hall, J. H. Baker, G. Robson, J. Rowley. *Soloists.*—Messrs. R. D. Bednell, W. Swann, E. J. Brighton, H. J. Willis, S. H. Smith, E. R. King, G. Robson, J. Rowley, R. L. Jackson, C. W. Fellowes. *Passengers.—With Mr. Jackson*—Mrs. Harley, Messrs. L. V. Mann, W. M. Morris. *With Mr. Brighton*—Messrs. E. J. Wynn, J. H. Moon. *With Flt. Lt. Rose*—Mrs. Willis, E. P. Lane.

On Tuesday Mr. Robson was launched solo, which he performed satisfactorily.

The Club, under the Presidency of Mr. Herbert A. Pepper, Chairman of the Council, on Friday evening entertained to dinner Mr. McDonough, who has been flying instructor for the past two and a-half years, and has received an appointment in Canada. Many tributes were made to the exceptional abilities of Mr. McDonough as an Instructor, and also to Mr. W. J. Halland, the Ground Engineer, for having maintained such a high standard of aircraft maintenance.

Flt. Lt. T. Rose, D.F.C., the newly-appointed Instructor, replied to the toast of "the visitors," proposed by Major Gilbert Dennison.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Feb. 26.

Flying Time 54 hr. 40 min. *Soloists* 32 hr. 35 min. *Passenger Flights* 9 hr. 30 min. *Tests* 1 hr. 10 min. *Instruction.—With Flt. Lt. Swoffer*—Mrs. Ranald, Mrs. Watson-Taylor, Lt. Ranald, Lt. Richardson, Messrs. Leach, Scott-Hall, Yeatman, Perfect, Heineman, Fry, Fawkes, Shepherd, Kerry, Southcliffe, Baynes, Mandeville, Whittle, Puttock, Bull, Courtney, Curtis-Nuthal. *Soloists.*—Mrs. Ranald, Messrs. Heath, Kirby, Cripps, Fry, Cierva, Leach, Cooper, Shepherd, Yeatman, Heineman, Perfect, Fawkes, Raynham, Baynes, Deane, Parker, Fagan, Wells, Bowen, Lt. Ranald, Capt. Balfour. *Passengers.—With Flt. Lt. Swoffer*—Mr. Dickson, Mrs. Crook, Mr. Matthews, Mr. Cripps, Lt. Pugh, Mrs. Swoffer, Capt. Balfour, Mrs. Pashley, Mr. Rosevear, Lt. Unwin, Mrs. Balfour, Mr. Mariner, Mr. Ebbutt. *With Mr. de la Cierva*—Mrs. de la Cierva, Mrs. Swoffer. *With Mr. Leach*—Mr. Lumsden. *With Mrs. Ranald*—Lt. Ranald, Lt. Simpson. *With Mr. Raynham*—Mrs. Raynham. *With Mr. Deane*—Mr. Ferdrey, Mr. Stokes. *With Mr. Bowen*—Mr. Burney.

Owing to the great keenness of some of the members, and the energy and able assistance of the ground engineer and his assistant, i.e., Mr. Lenny and Mr. Tubbs, we have had a record flying week for the Club, and on Sunday we had a record day of 14 flying hours. We were assisted of course by the fine weather.

We have now three machines, and members can always be sure of getting a flight when they attend at the Club.

Mrs. Ranald, who is qualifying for her "B" License, gave a very fine exhibition of aerobatics during the week, to the delight of our less advanced pupils.

Messrs. Downes-Shaw and Jopp, of the Bristol Club, and Captain Stack, from Croydon, paid us a visit last week, and we were pleased to welcome them.

We were delighted at Hinkler's wonderful success, and hope he will be available to take part in our Pageant at Whitsun, together with his Avian.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwich.]

Report for week ending Feb. 26.

Flying Time 17 hr. 40 min. *Instruction.—With Mr. Lines*—Messrs. N. Brett, W. Cullum, G. Watson Parker, G. Barker, F. Lambert, C. Gowing, R. F. Potter, G. Surtees, H. Mack. *Soloists.*—Messrs R. T. Harmer, W. P. Cubitt, W. A. Ramsey, F. Gough, H. Pank, R. Moore, W. S. Townen, N. Brett. *Passengers.*—Miss R. Moore, Mrs. G. Watson Barker, Miss Doone, Miss Mary B. Sutton, Miss Pank, Messrs. A. J. Finch, A. E. Plumstead, L. Gowing.

Mr. N. Brett accomplished his first Solo in a most credit manner. This is the first pupil to be trained solely on the A and the result is very satisfying. At last we have been able to s on the Club House improvements, and a Ladies Cloak Room has b added. In future on Saturdays light luncheons will be obtain at the Club House.

We are pleased to announce that an Avro Avian machine will us during the week and will stay several days. Also within next fourteen days we hope to have visits from Blackburn, We Widgeon, and Moth "X" machines, and we hope as many mem as possible will come and view them.

Mr. A. Kirkby will begin duties on Monday next as Gro Engineer for the Club.

As our flying kit is now in a very dilapidated condition member advised that they will have to provide their own in future. feel this will be a far better arrangement. The Club House Impr ment Fund has now reached the sum of £25, but to carry out all have in mind in this departure it will have to be doubled.

Arrangements are made to lay a Putting Green almost immedia close to the Club House, and a Badminton Set is being installe the Hangar. Thus while members are waiting to fly they will be to avail themselves of some other form of sport.

Since the reorganisation of the Club 45 associate and 8 ac members have been enrolled bringing the total membership to 223.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Feb. 26.

Flying Time 13 hr. 35 min. *Instruction.—With Mr. Lowdell*— Sylvia Edwards, Miss Georgia Rhodes, Dr. Dunn, Messrs. C. Han R. Brown, K. Peck, T. Marriage, F. Verney, G. Smith. *Passenge With Mr. Lowdell*—Miss Payne-James, Dr. Payne-James, Messrs. R Walker, Barrett, B. F. Marriage, Day, Low. *With Mr. Prent* Mr. Yelliby, Mr. Burrows. *Soloists.*—Dr. Jas. Sleigh, Messrs. S. S field, K. Peck, R. Brown, C. N. Prentice.

Although we had the misfortune to break a tail skid post which up flying for two days we have managed to pile up the hours p well considering we have only one machine.

On Saturday Mr. Kenneth Peck was launched solo after ha only four hours' dual. He put up an excellent performance. Roger Brown also went off solo on Sunday and made a numbe circuits and remarkably good landings. We hope to pick the Trea pocket pretty heavily within the next few weeks if this exce weather continues.

"Don't forget the Air Display Easter Sunday and Monday."

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Feb. 25.

Flying Time 27 hr. 20 min. *Instruction.—With Mr. Bartlett* 1 *With Mr. Tratman* 45 min. *Soloists* 12 hr. 50 min. *Passengers* 45 *Under instruction.*—Major Hume, Messrs. Greenhill, Bryan, T. Clarke, Candy, Girdlestone, Bolas, H. A. Tiarks, Arnold, Rob Bathurst. *Soloists.*—Messrs. Tratman, T. H. Clarke, Arnold, Rob R. A. Hall, Downes-Shaw, Candy, Bolas, Bathurst, Jopp, Hol *Passengers.—With Mr. Tratman*—Mr. L. Leaver. *With Mr. Bathu* Rev. Kay.

The fine weather enabled us to break our previous record hours by 2 hours 20 minutes.

Last Sunday Mr. Downes-Shaw took Mr. Jopp, as a passenge Hamble Aerodrome, where he interviewed the officials of the H shire Club. He also went on another occasion to Gloucester f visit to the aerodrome there. These cross-country flights are a proof of the utility and value of the light aeroplane.

We had the pleasure of sending a telegram of hearty cong lation to Mr. Hinkler on the success of his splendid voyag Australia.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending Feb. 26.

Flying Time 18 hr. 39 min. *Instruction* 1 hr. 21 min. *So* 5 hr. 30 min. *Passenger Flying* 11 hr. 18 min.

FLYING SCHOOLS.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending Feb. 22.

Flying Time 19 hr. 25 min. *Dual Instruction* 15 hr. 15 min. *So* 4 hr. 10 min. *Dual.—With Mr. H. D. Davis*—Mrs. Ranalds, M McCabe, Van Gessel, Cooper, Whitley, Liniker, Crabtree, Hu Dr. Wall, Dr. Forcythe, Mr. Lattey. *Soloists.*—Messrs. Crat Liniker, Mrs. Ranalds, and Dr. Wall.

Mr. Crabtree is now flying A.J. from the front seat and is we the way for his "B" Licence.

Mr. Whitley and Mr. Lattey were launched off Solo and put up a very good show.

The enthusiasm at the School is now up to "Fever heat" an several occasions Verey Lights have had to be fired off to get Soloists to land. The new Dual machine is now almost completed should take the air during the week.

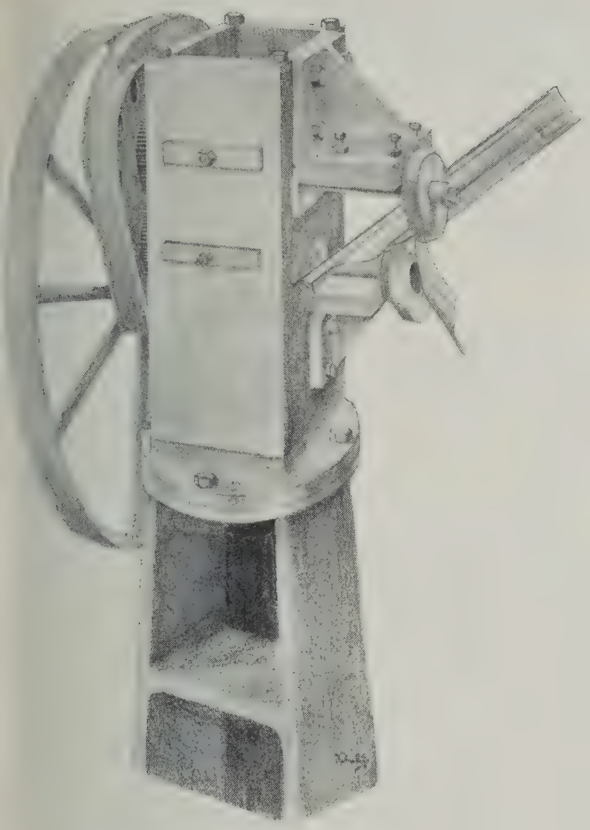
The De Havilland Flying School.

Report for week ending Feb. 26.

Flying Time 37 hr. 55 min. *Instruction.*—Dual 7 hr. 50 min. 16 hr. 55 min. *Other Flying* 13 hr. 10 min.

Despite the fine weather of the past week the early morning has persisted so far into the day that only a relatively small an of flying has been possible.

In addition to the normal School work, tests and demonstratio the extent of 13 hours 10 minutes have been made, including very important tests on Handley Page Slots and other s experiments.



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METAL AIRCRAFT

No. 3.—The Tongue-Cutting Machine.

The provision of efficient machine tools, even for subsidiary operations, has been made the subject of close study in the "Bristol" Works. The tongue-cutting machine illustrated here is an example.

It may be that a length of strip of 100 ft. or more has emerged from the rolling mill for forming on the draw-bench where strips of 35 to 40 ft. in length only can be dealt with. With the machine shown tongues can be cut on each individual length of section with ease and rapidity. Although but a minor operation, it is a great improvement in method over the usual system of tongue-forming with hand shears.

The machine is capable of adjustment for any thickness of section.

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C.F.H. 26

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 15; Tuesday, 17; Wednesday, 19; Thursday, 9; Friday, 17; Saturday, 16; Sunday, 4

IMPERIAL AIRWAYS LTD. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne : Machines 35, passengers 239, freight 14 tons.
AIR UNION :
Paris—London : Machines 31, passengers 99, freight 14 tons.
K.L.M. :
Amsterdam—Rotterdam—London : Machines 12, passengers 71, freight 3 tons.
SABENA :
Brussels—London : Machines 10, passengers 8, freight 1¼ tons
DEUTSCHE LUFTHANSA AG. :
Amsterdam—London : Machines 10, passengers 10.
PRIVATE :
Machines 0, passengers c.

Total number of trips by British Machines, 35, carrying 239 passengers, Foreign Machines, 62, carrying 188 passengers.

COMPARATIVE FIGURES.

Week ending Feb. 26 :
Machines 97; Passengers, 427; Crews, 187; Total personnel, 614.
Corresponding week, 1927 :
Machines, 68; Passengers, 198; Crews, 160; Total personnel, 358.
Corresponding week, 1926 :
Machines, 81; Passengers, 230; Crews, 101; Total personnel, 331.
Corresponding week, 1925 :
Machines, 74; Passengers, 134; Crews, 89; Total personnel, 223.
Corresponding week, 1924 :
Machines, 46; Passengers, 38; Crews, 72; Total personnel, 110.
Corresponding week, 1923 :
Machines, 53; Passengers, 164; Crews, 102; Total personnel, 266.
Corresponding week, 1922 :
Machines, 45; Passengers, 81; Crews, 74; Total personnel, 155.
Corresponding week, 1921 :
Machines, 30; Passengers, 32; Crews, 38; Total personnel, 70.

Croydon Notes.

With the coming, at last, of a spell of good weather, air traffic to and from Croydon has gone up in a way that augurs well for the coming year. Well over 400 passengers in one week is easily a record for February. The detailed figures for traffic day by day during this week are, however, curious. On Wednesday Imperial Airways had to run machines to Paris leaving at 08.05, 12.13, 12.57 and 13.00 hours, instead of the usual 08.00 and 12.00 services. These four machines carried 36 passengers, out of a total of 62 carried on all routes by that company.

On the Thursday following only one machine was required to Paris, carrying four passengers, and the whole day's traffic on Imperial Airways was carried by four machines and consisted of 16 passengers only. There seems no apparent reason for this very violent fluctuation, but it is symptomatic of the present condition of air traffic.

The overall increase in traffic in this week is shared by all the lines running into and out of Croydon, and extends to the goods traffic. The K.L.M. passenger figures have gone up very notably, and it is interesting to notice that H.NAED, the new twin-engined Fokker, has been carrying loads of up to 13 passengers per trip.

The original control tower at the Plough Lane side of the aerodrome is still in use. Some difficulties of calibration or adjustment in the new wireless direction-finding gear are alleged to be responsible for the delay in changing over to the new control tower.

The fine weather has given Mr. Neville Stack, of the A.D.C. aircraft, the opportunity of paying a number of visits to flying clubs in order to keep in touch with their work, and with the behaviour of their Cirrus engines. During this week he has visited the London Club and the Hampshire Club on this errand, flying the A.D.C. Moth G-EBUF. He has also had occasion to visit Farnborough on some undisclosed business. By way of filling in spare time he has been flying the "wireless" Bristol Fighter G-EBIO for tests for the Marconi company.

A SOUTH AFRICAN AIR LINE.

According to *The Times*, a company with the title of African Airways, Limited, and with an influential board of directors, is being registered at Pretoria to establish an air mail, passenger and freight service between Durban and Johannesburg, beginning in June or July next. An tension of the service along the coast to Cape Town is co templated, and possibly to Rhodesia. The Union Gove ment is granting an annual subsidy of £8,000, and many i portant concessions.

The service will operate daily each way, except on Su days The time of the journey between Durban a Johannesburg will be three hours, and the charge per approximately £8. The fleet providing the service will co prise three D.H.61 and three D.H. Moth aeroplanes. T staff will be composed entirely of South Africans, and pilots will be selected from the South African Air Fo Reserve.

HONG KONG ENTERPRISE.

According to *The Times* it is officially announced that Imperial Government is contributing £100,000 towards cost of establishing a civil and military aerodrome at Kait near Kowloon City.

THE HENDERSON FLYING SCHOOL IN SOU AFRICA.

On Nov. 21 Lieut.-Col G. L. P. Henderson arri in Cape Town with three Renault-Avros to open a branch the Henderson Flying School in South Africa.

He has established headquarters at Young's Field, W berg, Cape Town, and on Nov. 26 he had his first mach flying, in spite of the fact that it had only arrived by cr two days previously. All his machines were erected Dec. 10.

On Nov. 23 he assisted at the reception arranged by Cape Town Flying Club in connection with the offi acceptance of the Avro Avian which has been presented the South African Aero Club by the Shell Company of So Africa. Colonel Henderson officiated as one of the pil and opened the proceedings with a display of fancy fly later relieving the other pilots, as occasion arose, in th task of carrying passengers.

As soon as he had his machines in operation he organi a series of joy-rides over Table Mountain, and he has out to give every assistance to the local flying club organising a series of flying displays at Wynberg.

The first meeting was held on Dec. 11, and in spite the inclement weather and an attempt made by the churc to stop Sunday flying, a crowd of 6,000 was in attenda

Six machines took part at the meeting. These were Henderson's three Renault-Avros, two D.H. Moths bel ing to Major Miller, and Lady Heath's Avian. The A was unfortunately put out of commission with a dama undercarriage, but the remaining five machines contin to carry passengers throughout the afternoon. An promptu air race was won by Major Miller on one of Moths. Other events included a wing-walking dis by Messrs. A. Anderson and C. Allen on an Avro, pilote Col. Henderson, and exhibition flights by Col. Hende and Lady Heath, both on D.H. Moths loaned by M Miller.

Another meeting was held successfully on Dec. 16. both these meetings enclosures were built, licences arra and a number of landing grounds secured and cleared Col. Henderson's staff.

At Christmas the Henderson Flying School received i tations to send machines to Strand, Hermanus, Ewelen and Melkbosch for passenger-carrying purposes.

On Dec. 31 one Avro was crashed by a South Afr pilot who landed cross-wind and turned over onto back 30 miles from headquarters. All four planes, ce section and rudder were written off. The machine back in service on Jan. 19. On Dec. 30 Mr. Daven force-landed in a ditch with a broken rocker arm and b the undercarriage, bottom planes, airscrew, etc. Altho this happened 85 miles from Wynberg this machine back in service five days later. This machine later suff a complete engine-seizure and a forced landing 30 from home. A spare engine was completely dismantled inspection, re-assembled and fitted in the machine in days. All this work was done with a staff of two mechanics and three untrained native boys.

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AEROPLANE ACCESSORIES OF QUALITY.

The fact that Rubery Owen Accessories were used on the "Avian" machine with which Mr. Bert Hinkler made his remarkable flight from England to Australia, is in itself sufficient evidence of the outstanding quality of their products.

RUBERY, OWEN & Co.
DARLASTON, SOUTH STAFFS.

xtract from "Morning Post," 11-2-28.

FAR EAST FLIGHT.
STRIKING REGULARITY OF FOUR R.A.F. FLYING BOATS.

The wonderful regularity with which the four R.A.F. metal "SOUTHAMPTON" flying boats are carrying out heir flight to the Far East is emphasised by the calm understatement of the official log for the journey as far as arachi, issued last night. The flight, under the command of Group Captain H. M. Cave-Browne-Cave, left elixstowe for Plymouth on October 14, 1927.

Thereafter, with striking regularity, these four flying boats travelled in formation to Naples, Athens, Aboukir, asra and Karachi. The fact that four aircraft together were able to carry out the journey with such regularity is a triking tribute to British design and workmanship.

The machines were made by the two firms which succeeded in winning the Schneider Trophy for Britain, Supermarine and Napier. Each boat has two Napier engines. The objective of the Far East Flight is Australia. It is the ongest formation flight ever attempted.

"SOUTHAMPTONS" DESIGNED AND CONSTRUCTED BY
THE SUPERMARINE AVIATION WORKS, LTD., ENG.

carried, 50 hours school flying was accomplished and one "A" certificate was obtained in four weeks.

Col. Henderson's arrival in South Africa has certainly resulted in a renewal of interest and confidence in aviation in the Union and his helpful co-operation with the Flying Club movement has been very much appreciated.

A FLYING SCHOOL AT VANCOUVER.

Eve Brothers, of Vancouver, B.C., are opening a flying school in that city and an aerodrome site on Shelbourne Street has been approved by the Federal Government Inspector and granted an aerodrome licence.

Two machines have been acquired, an Alexander Eaglerock three-seater (90 h.p. Curtiss OX-5 engine) and a Driggs Dart two-seater (45 h.p. Anzani engine) and both have been tested by an officer of the R.C.A.F. and given Certificates of Airworthiness.

The chief instructor is Mr. A. H. Wilson, late R.N.A.S. and R.A.F., and Mr. A. Cressy has been engaged as ground engineer.

Fourteen pupils have been enrolled for the first flying course and three are already on the waiting list of the second course.

WHAT THE CIRRUS HAS DONE.

One of the best examples of advertising printing one has seen is a twelve-page pamphlet entitled "The Triumph of the Cirrus Engine," just published by A.D.C. Aircraft Ltd., 89, Kingsway, W.C.2. It sets forth quite clearly the excellent work which the Cirrus has done during the past year or two and gives enough information about the production of the Cirrus to give prospective users every confidence in it.

The pamphlet is excellently illustrated with photographs of the various types of machines in which the Cirrus engine is being used, and the middle pages are occupied by very good photographs of sixteen well-known pilots who have either made the Cirrus engine famous or have built up their own fame thanks to the Cirrus. A.D.C. Aircraft Ltd. will be pleased to send copies to air enthusiasts who care to write and ask and mention THE AEROPLANE, and in view of Mr. Hinkler's triumph the publication is worth having as a souvenir, although it was produced before the Cirrus made that record-breaking performance possible.

CAPT. CAMPBELL'S RECORD.

In the notice appearing last week with regard to Capt. Malcolm Campbell's record run of 207 m.p.h. on the Napier-Campbell car, one omitted to mention that the spirit used was Pratt's Ethyl mixture, commonly called "Pink Gin."

One regrets the omission, which is partly due to the fact that the publicity department of the Anglo-American Oil Co. seemed to be hiding the light of Ethyl under a bushel and failed to send a reminder that their product was used.

In a record of this kind there are so many proprietary articles to be mentioned that the more obvious factors occasionally get missed, largely owing to their very obviousness. As a matter of fact the high-compression Lion with its 10 to 1 compression ratio will run on nothing but Ethyl mixture, so that really it was as unnecessary to mention that Ethyl was used as it would have been to say that cylinders were used.

G. D.

MORRIS CARS AND VANS FOR THE R.A.F.

A contract has been placed by the Air Ministry with Morris Commercial Cars Ltd., of Birmingham, for a number of 6-wheeler tenders and other similar vehicles for the R.A.F. These 6-wheelers are remarkable for their speed on the road. On bad ground, such as rough aerodromes or fields, they are unsurpassed as to springing, speed, and general manœu ability.

A contract has also been placed with Morris Motors (19 Ltd. for a number of 15.9 h.p. Morris-Oxford touring cars

As one of the most consistent users of the humbler gra of Morris Cars one can congratulate the Air Ministry on th selection.

As a cheap car that never goes wrong even under the wo mishandling, the Morris, whether it be an Oxford, Cowl or Commercial, can hold its own with any car in the Wor

G.

MORTGAGES AND CHARGES.

CIRRUS AERO-ENGINES LTD.—Debenture dated Feb. 13, to secure £3, charged on the company's undertaking and property, present future, including uncalled capital. Holders: Capt. J. A. R. West Stevens, Woolley Cottage, The Thicket, Maidenhead. (The debent ranks (a) pari passu with four outstanding prior lien debentures £500 each in favour of Embeco Trust Ltd., and (b) in priority to debentures of £20 each on each of which £15 is outstanding.)

PERSONAL NOTICES.

DEATH.

JACKSON.—On Feb. 20, near Jarishan, 'Iraq, in the course of action, Rolf Booth Hilton Jackson, Flg. Off., No. 55 (Bombi Squadron, R.A.F.

Mr. Jackson passed out of the R.A.F. Cadet College, Cranwell, December, 1923, and was posted to No. 32 (Fighter) Sqdn., at Ken In December, 1925, he was posted to No. 30 (Bombing) Squadron Hinaidi and in March, 1927, he was transferred to No. 55 (Bombi Squadron for air pilotage duties. Mr. Jackson was a member the Cranwell athletic team.

FORTHCOMING MARRIAGE.

COLE-HAMILTON—FOX.—The marriage arranged between Sq. J. B. Cole-Hamilton and Miss H. V. Leslie Fox will take place 2 o'clock on Tuesday, June 12, at St. Giles' Church, Bradford-on-T Taunton.

MARRIAGE.

DAVIS—VAN DER GOES.—On Feb. 21, at St. Marylebone Pa Church, Flt. Lt. E. P. M. Davis, A.F.C., A.M., eldest son of Adm Edward Davis, C.M.G., to Frederika, elder daughter of H.E. Jonkheer Van der Goes, Netherlands Minister in Rome.

BIRTHS.

ARMSTRONG.—On Feb. 23, at 7, South Street, S.W.7, to Al (*née* Barré-Phipps), wife of Gerald Armstrong, Flg. Off., R.A son.

COYSH.—On Feb. 19, at Beaufort House, Twickenham, to Ei (*née* Smith), wife of Harold Coysh, D.F.C., L.D.S. (Eng.)—a son.

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THE BRITISH AIR LINE TO THE CONTINENT.

THE AEROPLANE—MARCH 7, 1928.

FLYING BOATS.

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

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Vol. XXXIV: No. 10. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"A WOODY THEATRE OF STATELIEST VIEW."

(Milton).

PERFECT PEACE:—A Fairchild monoplane belonging to the Fairchild Aerial Surveys Co. (of Canada) Ltd. at Mica Bay, on Lake Manouan, about 200 miles North of Lake St. John. Mr. K. F. Saunders, chief pilot of the company is shown seated on a log refuelling himself.

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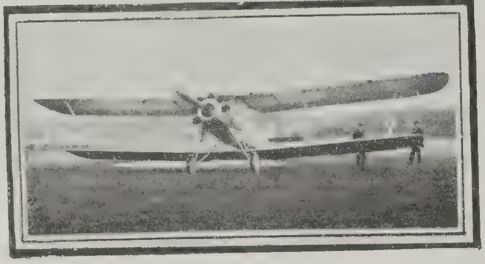

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Aviation Department,
VICKERS HOUSE, BROADWAY, LONDON, S.W.1.

MAR. 7, 1928.

THE AEROPLANE

Incorporating Aeronautical Engineering

VOL. XXXIV. No. 10.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON FLYING-BOATS,—THE FAR EAST—AND AUSTRALIA.

ly we are coming along in this flying-boat business. e was a time when such craft were sadly and badly cted by the Air Ministry. Those firms and those de- rs who had devoted themselves to flying-boats went gh a very bad time, and some even began to think that were backing a loser. But those behind the scenes knew like everything else which the Air Ministry has done the outbreak of Peace, the apparent neglect of flying- was not due to any disbelief in their usefulness, and was ly part of a set policy forced upon the Air Ministry by inancial state of the Nation.

r the end of the War, the R.A.F. was practically dis- ed, very little money was available for it, and what little was had to be spent on re-building the Air Force from undations. We had a fair supply of pilots, but nearly e best mechanics had gone back to their trades.

re was no good in having pilots without machines. was no good in having machines without mechanics. anics could not be got until they were trained from the and mechanics could not be trained wihout proper cks and workshops.

first of all money was spent on buildings. Then it was on training mechanics. And to find that money, all nditure on expensive aircraft such as airships and big -boats had to be stopped, so that what was left over buildings and training could be spent on absolutely sary re-conditioning of war-time types of machines and ying a few of the less expensive types of new machines.

amount of money available for the Air Force even to-day mittedly inadequate to build an Air Force big enough e needs of the British Empire. But year by year of late has been a little more money available for new machines onsequently more of it is now being spent on flying- . The result is that in the past three or four years, gh we have not built very many flying boats, we have quite a number of different types. And though other nations have built flying-boats with greater engine-power than any of ours, no nation has produced boats which are as seaworthy or have such high speeds or are capable of carrying as big a useful load as ours.

Because of the limited amount of money which we have been able to spend on the type, the more credit is due to the producers of the Blackburn Iris, the Supermarine Southampton, the Short Singapore and Calcutta, and the Saunders Valkyrie, all of which are far ahead of the flying-boats of other nations.

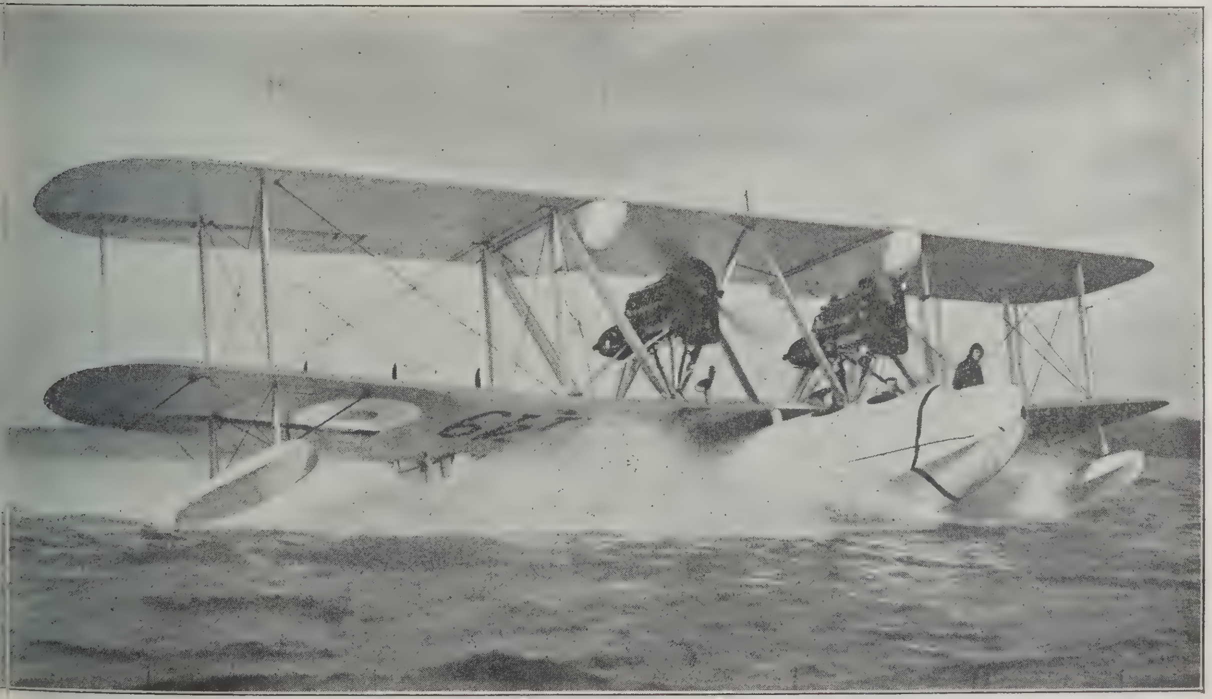
THE FAR EAST FLIGHT.

The outstanding proof for all the World of the superiority of British flying-boats is the safe arrival at Singapore of the four Supermarine Southamptons with their Napier engines.

To a certain extent this journey was a daring experiment. The R.A.F. knew perfectly well what the ordinary Southampton would do, but they were not so certain about the behaviour of metal hulls in waters of various chemical qualities and temperatures. This prolonged test has fully justified the faith which the Supermarine people themselves put in their metal hulls. And the whole flight confirms the faith which the R.A.F. has so long held in the Napier Lion engine.

But there is a certain humour in the discovery, made in the course of a fortnight's mooring in Karachi Harcour, that the age-old enemy of shipping, the barnacle, has the same affinity for the bottoms of our latest sea-going craft as it had for shipping in the days of Noah, or earlier. And there is one curious fact about the said barnacles which is of interest.

As those who were familiar with the details of the boats of this Flight will remember, the hulls are painted white, and to distinguish one boat from the other, the boats have respectively one, two, three and four black bands painted round the hull. When they were beached at Karachi to be scraped, the scrapers found that the barnacles were stuck much more thickly on the black paint than on the white part of the hull, which seems rather hard on No. 4 of the Flight.



FOR IMPERIAL DEFENCE.—A Supermarine Southampton (two 450 h.p. Napier Lion engines) belonging to the Far East Flight undergoing trials on Southampton Water before leaving for the East. Machines of this type will be ultimately based at Singapore.

Here then is an interesting question for biologists,—Why do barnacles like black paint? Which seems about as intriguing as the question,—Do shrimps make good mothers? At any rate this curious little experience does show that even with metal hulls, flying-boats operating in tropical waters must be taken out and scraped fairly often.

WHAT THE LOG SHOWS.

The official log of Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.S.C., a condensed version of which appeared in THE AEROPLANE on Feb. 15, shows that the Flight had practically no trouble either with the boats or the engines, at any rate on the way to Karachi. What trouble there was happened to the installation of the power plant, not through any defect in the design of the installation but purely in details. And there was a lot of trouble with wooden airscrews.

Before starting from Plymouth, the rubber hose between engines and radiators was lengthened to relieve vibration stresses, and one machine had a new radiator,—as usual the weak spot where water-cooled engines are used.

Off Corsica one boat had to come down because there was a cracked nipple where the oil-pressure gauge pipe joined the engine. The oil gauge was blanked-off temporarily and the boat proceeded to Naples. On a trans-Oceanic flight in a heavy sea, this trouble might have meant the loss of the ship, and it indicates the need for making engines accessible while in the air, for such things will occur even with the best of engines.

At Aboukir one of the boats was fitted with an airscrew made by the R.A.F. Depot there, but the log does not indicate whether this was done purely as a compliment to the R.A.F. Depot, or whether a new airscrew was actually needed, or whether this screw was fitted so as to have the original screw available in the boat as a spare.

One day's flying later on at Alexandretta, another boat had to change *both* airscrews as the brass on the blades had begun to bulge. Here is another indication of how premature any attempts at trans-Oceanic flights are as yet. Also this seems a fairly strong argument in favour of metal airscrews.

Attaching thin sheet-metal to wood and expecting it to stay there under the centrifugal force, and the vibration, and the battering of wet and wind such as are inflicted on the tip of an airscrew, seems horribly unmechanical in these days. At Hinaidi yet another boat found that the brass tips were parting company from her airscrews, and temporary repairs were made which lasted (somewhat precariously one imagines) to Basrah, where new screws were fitted.

The log as published only goes as far as Karachi, so at present there is no information as to what renewals of parts of the machines and engines were made at Karachi, but up to that point nothing had gone wrong with either the aeroplanes or the engines. All the troubles were with parts and accessories which were not built by makers of aircraft. But all the failures, or almost-failures, were such as to have caused the loss of the ship if they had happened duri trans-Atlantic flight.

The regularity with which the Flight kept to its sche all the way round India and down to Singapore, seem indicate that no serious trouble of any kind happened t after. Once more the Napier engine has established i as one of the most reliable transport mechanisms in World. And the Southampton flying-boat with the metal has proved decisively its ability to stand up to wind, and weather of all kinds.

THE INTERNATIONAL ASPECT.

Apart from the good effect along the route of showing Flag on a formation of big flying-boats, the arrival of Far East Flight at Singapore is of great International sig cance, for it is the first time any of our war machines gone by air to the base from which in the next War we have to hold the command of the Indian Ocean and Pacific.

Though the boats met the Navy several times on the out and were treated most kindly wherever they met,— to the extent of the Navy inviting R.A.F. officers to dine sleep on board H.M.S. *Enterprise* at Bushire and H. *Triad* at Henjam, the journey was done without dependin any way on the Navy's help. Thus we see that so lon the Air Force holds the control of the air in Arabia and the Persian Gulf, we can send quantities of flying-boats to Singapore, even if the Navy happens to be tempor incapacitated in Far Eastern waters, or is too busy figh to have time to act as transport for the R.A.F.

For the particular kind of air work which will be wa from the Singapore Base in the next war, the big flying is the best possible weapon. Boats will have to patro channels through the Dutch Oil Islands between Singa and Australia to prevent enemy submarines from penetra into the Indian Ocean and interfering with the transport of our Merchant Navy, on which we shall have to de quite largely for our oil supply as well as for ordinary t

Our modern flying-boats are well suited for this work. have an immense capacity for useful load, so they can enough petrol for several days' patrolling, and a goodly su of depth charges for the discomfiture of submarines. B sea-worthy they can comfortably sit on the water at nigh the various bays and creeks of the islands, or take sh there in case of very heavy weather, instead of having home to a base either at Singapore or in Australia or on of the Dutch islands.

Also, as the history of the flying-boat patrols from mouth and Felixstowe shows, a formation of flying-boa fairly safe against attack by fighting machines unless fighters happen to be in immensely superior numbers. undoubtedly the big flying-boat will prove itself to be most desirable equipment for our bases at Singapore Port Darwin in Australia.

Naturally there will have to be also fairly strong e lishments of fighters to protect these bases against en

FOR IMPERIAL COMMUNICATION.—The Short Calcutta (three 485 h.p. Bristol Jupiter engines), the latest all-metal passenger flying-boat, two of which are to be operated by Imperial Airways on one of the stages of the England to India air route.

Further proof of Napier's consistent reliability!

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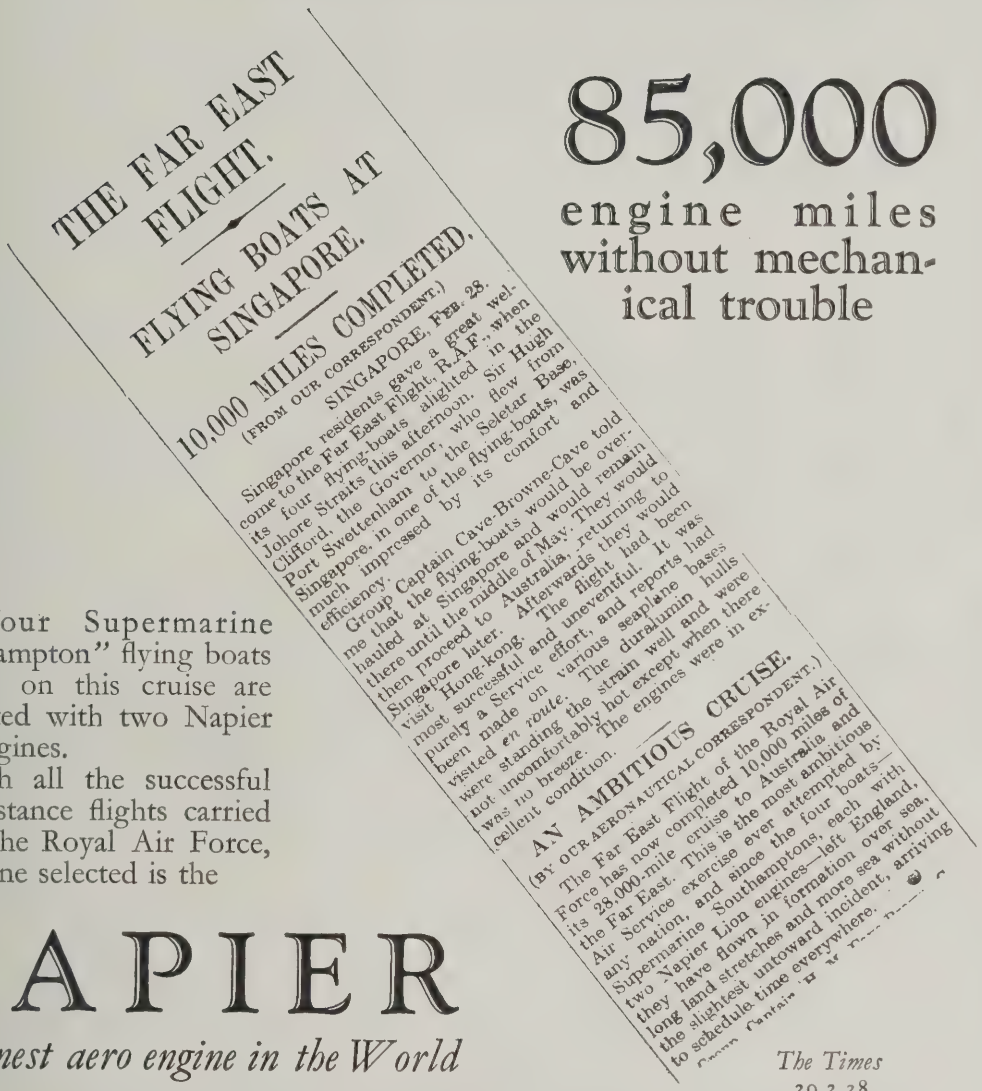

THE FAR EAST FLIGHT.

FLYING BOATS AT SINGAPORE.

10,000 MILES COMPLETED.

(FROM OUR CORRESPONDENT.)

SINGAPORE, FEB. 28.

Singapore residents gave a great welcome to the Far East Flight, R.A.F., when its four flying-boats alighted in the Johore Straits this afternoon. Sir Hugh Clifford, the Governor, who flew from Port Swettenham to the Seletar Base, Singapore, in one of the flying-boats, was much impressed by its comfort and efficiency.

Group Captain Cave-Browne-Cave told me that the flying-boats would be overhauled at Singapore and would remain there until the middle of May. They would then proceed to Australia, returning to Singapore later. Afterwards they would visit Hong-kong. The flight had been most successful and uneventful. It was purely a Service effort, and reports had been made on various seaplane bases visited *en route*. The duralumin hulls were standing the strain well and were not uncomfortably hot except when there was no breeze. The engines were in excellent condition.

AN AMBITIOUS CRUISE.

(BY OUR AERONAUTICAL CORRESPONDENT.)

The Far East Flight of the Royal Air Force has now completed 10,000 miles of its 28,000-mile cruise to Australia and the Far East. This is the most ambitious Air Service exercise ever attempted by any nation, and since the four boats—Supermarine Southamptons, each with two Napier Lion engines—left England, they have flown in formation over sea, long land stretches and more sea without the slightest untoward incident, arriving to schedule time everywhere.

The Times
29.2.28

The four Supermarine "Southampton" flying boats engaged on this cruise are each fitted with two Napier Lion engines.
As with all the successful long distance flights carried out by the Royal Air Force, the engine selected is the

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Cairo to Cape Town and back (twice), totalling		100,000 engine miles
Spain to Buenos Aires	—	12,518 engine miles

All above achievements completed without mechanical trouble of any description.

bombers, and probably an equipment of high-speed torpedo machines for defence against attack by warships on the surface will be needed. But for the all-important anti-submarine patrols the big flying-boat is certainly the thing.

Sir John Salmond's Task.

The forthcoming visit of Air Marshal Sir John Salmond to Australia, at the request of the Australian Government,—as is duly recorded in the R.A.F. Section of this paper,—is of particular interest in view of the arrival of the Far East Flight at Singapore and the extension of the flight to Australia which has been planned for a few months hence, when it will co-operate with the two wooden Southamptons which have been sent by ship to the Royal Australian Air Force.

There is no officer better fitted to advise Australia on air defence than is Sir John Salmond. Essentially a soldier, he has the Army's clear-cut way of thinking and of expressing himself, and the direct-speaking Australians will appreciate his directness of statement. But they will do well to remember that besides being a soldier he was one of our earliest Army aviators—and one of our best.

As an Instructor at the Central Flying School he actually taught many of the senior officers of the R.A.F. to fly. Until quite recently, when the cares of high command deprived him of time for practice, he was as good a pilot as any in the R.A.F. And even now he prefers flying to other modes of transport over any other than short distances.

In 'Iraq from 1922 to 1925, when he flew all over the country, and himself led air attacks on enemy strongholds in the Kurdish hills, he had the experience of being the first Air Officer to have command of the land and air defence forces of a whole Nation. And his success in organising those defences, under very difficult internal and external political conditions, proved that in such matters he is as able as he showed himself to be when he was General Officer Commanding-in-Chief the Royal Flying Corps and later the Royal Air Force in France from the beginning of 1918 until the Armistice.

His latest task has been the organisation of the Air Defence of Great Britain, and here he has again proved his foresight and power of co-ordination. Those who heard him speak on the subject during the Air Exercises last Summer realise how far ahead his schemes are laid for Home Defence. And, pending the allotment of enough money to the R.A.F. for the fulfilment of those schemes, he can well afford to leave them to develop themselves for a few months while he gives Australia the benefit of the knowledge which he has thus acquired.

Though his personal experience has been with land-machines, Sir John's mind is of the kind which is fully able to appreciate the possibilities and to see the limitations of sea-going aircraft. And as Australia can only be attacked by sea, Australians may depend upon him to advise their Government rightly as to the best types and best uses of aircraft of all kinds to repel such attack. And, having the greatest respect for Sir John's judgment, one would wager that big flying-boats will have a prominent place in any programme of Air Defence which he may suggest to the Australian Government.

The Cobham Survey.

In quite a different activity the Short all-metal Singapore, with its Rolls-Royce Condors, has equally proved its value. In spite of the battering it had at Malta, due to the unforeseen necessity of beaching it under unfavourable conditions, the Singapore hull has stood up to stresses which were never foreseen even in its designer's most pessimistic mood.

Since then, Sir Alan Cobham has proved beyond doubt that the big flying-boat is the right type of machine for service between Khartum and the Great Lakes. The floats of a single-engined seaplane can hardly be expected to stand up to collisions with floating logs. But a boat hull such as would stand hammering on the stonework of a Maltese slipway, would make short work of such trifles as logs, hippos and crocodiles in Equatorial waters.

Moreover, in the event of a forced alighting, when a single-engined machine would be left unable to move, and would be very uncomfortable as an habitation in one of those long stretches of seldom-navigated waters of the Nile, a twin-engined boat, even if its trouble could not be repaired and if it were unable to get off again, could still keep going with one engine on the water a great deal faster than any of the Nile steamers, with their strings of barges. And its big hull would be at least as comfortable as any of those cramped and crowded steamboats.

The Question of Size.

The question which naturally arises from the recent success of the flying-boats is, what is the best size for this type of craft.

There is a very distinct limit to the size of land machines. Firstly, in spite of all the talk about infallible engines, a land machine must be small enough to have a reaso chance of getting down in ordinary country, and of ge away again, in case of a forced landing. Secondly, an mously large land machine is an awkward thing to ha and house on the ground. And thirdly, the undercarria a land machine has to be strong enough to carry the ma and consequently itself becomes an enormous dead load.

One has no exact figures as a guide, but one imagines in several of the biggest land machines the fuselage undercarriage must weigh at least as much as the hull flying-boat of the same power;—which, with the same f speed and the same get-off, has very much more cap inside. In fact one has heard of certain big land mac in which the undercarriage alone weighs as much as whole of a flying-boat hull of similar load-carrying capa

In the very big land machines something may be do improve matters by making the undercarriages with pillar tracks instead of wheels, which might concei be lighter and give less head resistance than wheels struts if big enough to stand up to the load,—but eve there are limits to the size of a land machine which d affect a flying-boat.

Also there is the advantage that the bigger a flying is built the more sea-worthy it becomes. The ordinary f boat of to-day, say of the size of the Southampton, is well able to get off the average rough sea, just as the av aeroplane of to-day is able to make useful headway ag the average strong wind. There will always be at winds strong enough and seas big enough to defeat planes or flying-boats. But the faster the aeroplane an bigger the flying-boat, the less it will be affected by and seas which are troublesome to existing types.

The size of flying-boats to-day is limited by the fact so long as the design remains the same, the weight incr as the cube of the dimensions. But with increase in new structural designs always seem to be produced, so actually at present flying-boats have become lighter in portion to their size, instead of heavier. And we may hope for improvements in this direction as the size incre

Small Flying-Boats.

There is also the question of whether there is not use to be made of small flying-boats, especially for the Air Arm. Hitherto, we seem to have pinned our faith much on land machines, very slightly modified, to be off and onto the decks of aircraft carriers. We have pro a certain number of float machines to be catapulte cruisers. And we have built a few amphibian float mach Also we have made a few amphibian flying-boats, but s as to be negligible.

If one remembers rightly, the first aircraft ever t launched from a catapult (in America, as usual), wa fact, a small Curtiss flying-boat.

We seem to have neglected this type of machine altog of late years. For reconnaissance work it has very dis advantages. And even as a single-seat fighter there good deal to be said for it.

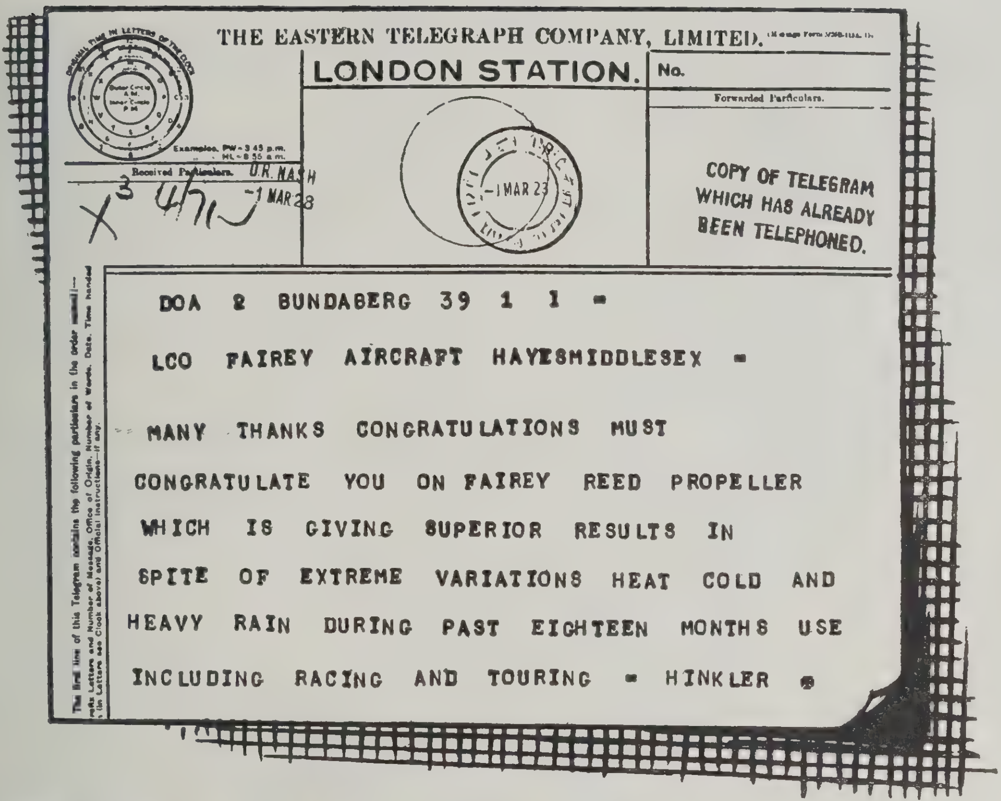
It is a difficult type of machine to design as a to dropper, but people *have* had ideas about longitudinal in the V-shaped bottoms of flying-boats, through whi torpedo can be dropped. That is an idea which mig worth experimenting. At any rate, anything seems than shooting ordinary land machines off the decks of car In case of engine failure there is practically no hope fo crew. And deck-landing, either with or without arr gear, though it may be fairly simple in a flat calm, is a certainly more dangerous if there is a sea running, alighting on the water in a flying-boat and being pick with a derrick.

The Carrier Question.

The whole position of aircraft carriers in Naval war to need careful consideration and experiment. The id cramming crowds of aeroplanes into a special ship and ing that ship along with a fleet into action, seems to appealed to the standard type of senior Naval officer as as his mind had grasped the idea that aircraft were useful,—at the end of four years' war in which the Navy entirely neglected to use aircraft as they should been used and very nearly succeeded in allowing a few German submarines to starve this country.

But the younger and brighter minds of the Navy who been brought up with the air idea, especially those who tr with the R.A.F. and have gone to the Fleet Air Arm, se think differently. Their idea seems to be that the ai carrier, as at present designed, is far too vulnerable an it carries too many eggs in one basket. One has hear cisely the same idea from intelligent American Naval of who say that they would very much rather have s small high-speed carriers than any of these fast battle-cru converted at the expense of millions of pounds into ca or one of the new big specially-built expensive carriers.

HINKLER'S GREAT FLIGHT



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The big flying-boat is certainly not the right craft to operate with a fleet at sea unless the fleet can guarantee to keep within a hundred miles or so of an Air Base. And big flying-boats cannot be handled on even the biggest carriers. So obviously the proper place for the big boat is a Coast Defence Base, whence it can protect a strip of water about 100 miles wide from the shore.

The general opinion seems to be rather that, instead of carriers operating with a fleet, they should keep well away from the danger area of submarines and gunfire, and that any aircraft which are needed *with* the fleet should be catapulted from warships. Thus apparently aircraft carriers should *be* carriers and not fighting ships. In other words they come into the category, albeit glorified, of fleet-colliers and supply-ships.

A USEFUL AMERICAN IDEA.

Nevertheless, carriers are necessary to the Fleet Air Arm, and so there is a good deal of interest in a proposition disclosed in *The Times* of February 29, put up by Mr. Laurence Wilder to the Merchant Marine Committee of the House of Representatives at Washington when hearing an appeal of the Trans-Oceanic Corporation of the United States for Government aid in the establishment of a fleet of six 35,000-ton trans-Atlantic passenger and mail steamers, designed to do the journey in four days from dock to dock.

The Trans-Oceanic Corporation, with which is linked the Brown-Boveri Electric Corporation and the New York Shipbuilding Company of Camden, New Jersey, plans that these ships should be built so that they can actually be used as carriers and operators of a few commercial aircraft in time of peace, and easily converted each to carry about one hundred aeroplanes in time of war. Mr. Wilder promises that these ships will maintain 33 knots for 7,000 sea-miles without refuelling.

In a fight for the mastery of the Pacific—such as that in which the United States, almost certainly assisted by Canada, (not to mention ourselves and the Dutch on the West of Pacific) must be engaged sooner or later, such ships, if performances come up to specification, should be of imm value. Except for the island of Guam, the States hav Naval Station worth mentioning, West of Hawaii. And American Fleet operating in the Pacific would find air carriers of such performance of immense value both as sc and as supply ships.

Probably some of the U.S. Admirals of the early (Navies being exactly alike all the World over) would wa keep these ships hanging around with the lame duck the Fleet. There they would probably be comfortably pedoed, much as some of our fastest ships were torpe during the War 1914-18 by being tied to the apron-string antiquated admirals.

At any rate, the production of high-speed passenger-s designed for transformation into aircraft carriers seen very much sounder idea than that of subsidising passen liners, as we have done hitherto, with the intention of ing them into auxiliary cruisers.

During the War these turned out to be almost useles cruisers. We spent millions in gutting some of our expensive liners to turn them into auxiliary cruisers, when they were found to serve no good purpose we s hundreds of thousands in turning them into hospital ship troop ships.

Undoubtedly in the next war in which the British is concerned it will need vast quantities of aeroplanes ca for it, so one suggests that when next arranging to s dise new high-speed passenger ships we should consider American idea. But in the meantime, if the R.A.F., wit big flying-boats is allowed a free hand in Coast Defence, if it be not consistently thwarted by their Lordships of Admiralty, we shall do quite well, even without many craft carriers.—C. G. G.

PROMOTION IN THE R.A.F.

The new system of promotion, details of which are published elsewhere in this paper, will at any rate be of considerable interest to all R.A.F. officers and to those who are thinking of entering the R.A.F.

Hitherto promotion has been by selection tempered by seniority. That is to say, promotions were made (half-yearly) by selecting officers from the list of officers of their rank who came within a zone which included a certain number down from the head of the list according to seniority. Occasionally an officer who had been a really bad boy was condemned to lose so many places in the seniority list, a reproof or punishment which might quite conceivably remove him from the promotion zone into the depths of those without hope so far as the next batch of promotions was concerned.

The system had much to recommend it. Those outside the zone were, at any rate, saved the nerve-strain of wondering whether their names would appear in the next promotion list. But there was always a certain sadness in January and July, when the promotion list appeared, in meeting officers of quite worthy antecedents celebrating for their own consolation what they grimly called the Feast of the Passover. And because promotion within the zone was entirely by selection, many really good officers have been passed over many times while others of less merit, but with perhaps greater ability in attracting attention to themselves, have been among the chosen people.

Under the new system, actual promotion will still be by selection from within the zone, but officers who are keen on their profession will have opportunities of improving their place on the seniority list so that they will either go further up in the promotion zone or may come into the promotion zone, although on actual years of service they may not be due to enter it.

As explained elsewhere, seniority will be antedated so as to give earlier promotion to officers who have acquired merit by distinguishing themselves as specialists, or by acquiring other Service qualifications, and to officers who are recommended as exceptionally suitable. Thus, for example, flying instructors will be given extra seniority for promotion to flight lieutenant, and graduates at the Staff College will be given seniority for promotion to squadron leader.

A correspondent objects that the weakness of the system is that it eliminates the useful, reliable and thoroughly valuable "squadron officer," whose commanding officer cannot spare him for special courses, and who is not actually employed as a flying instructor. This correspondent adds, "As a matter of fact, I cannot see where the useful, necessary, but not ornamental, adjutant comes in under the scheme unless he is spared for some administrative course, or is an A.O.C. recommendation." And the fear is ad "I suppose the A O.C. recommendations will go to A.O.C.'s own staff."

One believes that the suggestion that the A.O.C.'s staff are likely to be recommended is unjust. Such a might happen occasionally, but the majority of the s officers of the R.A.F., like our British judges, are a reproach. But there is perhaps something in the sug tion that the regular hard-working squadron officer, wh in fact, the essence and foundation of the best work in R.A.F., may miss his chance of advancement because he not made himself a specialist. During the War one many good men who missed their chances of prom because they were so good at their own jobs that their manding officers deliberately refused to recommend for promotion because promotion would mean losing One can only hope that A.O.C.'s will keep a special loo for officers of this type, so that they may give them necessary A.O.C.'s recommendation.

In a Service such as the R.A.F., which is essentially nical, and in which the technical branches differ so from one another, naturally special inducement mus given to specialise, and on the whole this scheme of dating seniority seems very sound.—C. G. G.

MECHANISED ARMIES AND AIRCRAF

In the course of an article on Tanks and Aircraft in *Army, Navy and Air Force Gazette*, of Mar. 1, Colon Rowan-Robinson, C.M.G., D.S.O., *p.s.c.*, says that the and range of mechanical vehicles will offer a cont menace to aerodromes. The latter could protect thems either by taking stations far to the rear or by a perma guard. The first method would reduce flying range enemy territory and the second method would immobi large number of troops and transport for the guard have to be strong enough to ward off tank attack and ably disposed to keep enemy dragon-guns out of ran the aerodrome, and it would have also to travel in l when the aerodrome moved. The first method would ably have to be accepted because aerodromes would re for the economic utilisation of sheds and stores, a long in one place. It might therefore be assumed that the duction of mechanisation would force a retired positio aerodromes and thereby lessen the value of friendly ai slightly and the danger of hostile aircraft considerably.

With regard to co-operation with aircraft, mechanis would tend to make Army and Air Force more than eve composite body. Reconnaissance was a case in point. armoured car, when engaged on this duty, would not exploit its speed unless the aeroplanes had declare country ahead to be free of the enemy. Nor could the of the aeroplane be fully accepted until the country had

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explored by the armoured car. The more nearly the pace of the ground unit approached that of the air unit, and the wider its range of activity, the closer must be the co-operation between the two. In battle the action of the aeroplanes with regard to friendly tanks would be mainly protective. Each Commander would seek to keep his main body compact both for manœuvring and hitting purposes which would make it a target for hostile aeroplanes beyond the shielding power of escorting A.A. guns. Therefore the first task of our aircraft would be the engagement of enemy aeroplanes and the achievement of local air superiority and their second task would be the attack of mass targets. A third might be the creation of a smoke curtain.

Reconnaissance and report would have to continue whatever other action they might be taking. Spotting for artillery might be found necessary as massed formations approached the battlefield. Once battle was joined the aeroplanes would have to direct their efforts against reserve formations and transport. In pursuit their main value would lie in indicating the direction of the enemy retirement.

Aeroplanes would be of great assistance in day outpost work and their help might also be invoked at night. Mechanised forces needed area protection for attack might come from any direction. At each post there would be a simple form of sound-ranger which, when operated in conjunction with similar instruments at adjacent posts, would give the range and direction of enemy machines. On receipt of these reports at H.Q. aeroplanes would be asked to drop flares on the line of approach indicated and to bomb the enemy when located.

THE CAIRO—BAGHDAD AIR ROUTE.

The paper by Wing Cdr. R. M. Hill, M.C., A.F.C., F.R.Ae.S., "Experiences on the Cairo—Baghdad Air Mail" read before the Royal Aeronautical Society, with which is incorporated the Institute of Aeronautical Engineers, on Mar. 1, was of exceeding interest, but scarcely of a type which it is possible to condense to any useful purpose. It contained much information for the uninitiated, but readers of The Aeroplane are already familiar with most of the facts. He did give, however, a very graphic picture of what the route itself is like, and of what was entailed in flying over it in 1924 or 1925.

At this period the Cairo—Baghdad mail service was operated by the R.A.F., with Vickers Vernons (two Napier Lion engines). Wing Cdr. Hill at that time commanded No. 45 Squadron—one of those which operated the mail service, so he has had much personal experience of flying over the desert. In addition he has a gift of graphic description, which gave his paper a value all its own.

Therefore the best one can do is to refer all those who are interested in the histories of the remarkable pioneering work done by the R.A.F. on this route to the paper which will in due course be published in full in the Journal of the Society.

In the discussion which followed, Lt.-Col. Sir Arnold Wilson, K.C.I.E., C.M.G., D.S.O., now General Manager in Iraq, Persia and the Persian Gulf of the Anglo-Persian Oil Co. Ltd., and from March, 1918, till October, 1920, Acting Civil Commissioner and Political Resident in the Persian Gulf, said that he believed that the first aerial crossing of the desert was made in 1919, long before the marking of the desert track, by two R.A.F. D.H.4s in one of which he was a passenger. [In this connection it is interesting to note that on Dec. 12, 1918, a Handley Page aeroplane arrived at Delhi after a flight, in several stages, from Cairo. This machine left Cairo on Nov. 30, 1918, and reached Baghdad on Dec. 1. No dates are given for the intermediate stages but the machine landed at Bushire, Bandar Abbas, Charbah and Karachi. The pilots of the machine were Major-General W. G. H. Salmond, D.S.O. (now Air Vice-Marshal Sir Geoffrey Salmond, K.C.B., K.C.M.G., D.S.O.), and Captain Ross-Smith, D.F.C. They were accompanied by Brigadier-General A. E. Borton, D.S.O. (now Air Commodore A. E. Borton, C.B., C.M.G., D.S.O.), as far as Baghdad, and two mechanics. An account of this flight appeared in The Aeroplane of Dec. 18, 1918.]

This trip started from Baghdad and crossed the Desert from Damascus, then flew South down Palestine and finally arrived at Cairo. It was a distinctly eventful trip, and included turning the machine on its nose on a flooded aerodrome in Palestine, a forced landing on one of the few possible pieces of ground in the Judæan Hills, and a number of minor incidents. A return trip—on D.H.9s—made a little later, passed without incident.

Sir Arnold said that the air mail service across the Desert had been and was of immense value. It was, however, only one link in a system which must extend very much further. At present the extension of Imperial Airways beyond Basrah was held up by political differences with the Persian Government.

There was a tendency in this country to blame the Persian Government for this fact. Persia had adhered to the In national Air Convention, but so far had not ratified adherence. Once she ratified she was bound to let the vice through. But he pointed out that Persia was q within her rights in this matter. Practically all exis Governments including our own had failed to ratify ag ments despite their having adhered to them, and Pers record in this respect was as good as that of any o country with the possible exception of our own.

He personally thought that the attempt to run the ser as an Imperial service was the root cause of this typ trouble, and that in the future the great air routes w have to be International rather than National in order avoid them.

The majority of the other speakers in the discussion fined themselves to expressing their appreciation of W Cdr. Hill's graphic story.

One speaker suggested that a very simple lighting sys would make the desert route ideal for night flying and would thus get over some of the difficulties of flying in cessively hot air.

Another—an official of the Anglo-Persian Oil Comp who had travelled by Imperial Airways—complained that seating accommodation on present machines was so comfortable that nobody would willingly pay to travel by and that certainly if night flying was to be adopted m greater comfort must be given.

ADMIRAL SIR CECIL LAMBERT.

The death occurred on Feb. 29, at the age of 63, of Adm Sir Cecil Foley Lambert, K.C.B.

Admiral Lambert became a Naval Cadet in 1877 and part in the operations connected with the Egyptian Wa 1882. He was promoted Lieutenant in 1883 and Comma in 1900. He was appointed Naval Assistant to the Sec Sea Lord in 1910 and in 1912 he became Commodore of Flotillas of the First Fleet. In December, 1913, he bec Fourth Sea Lord of the Admiralty.

In February, 1919, he was appointed Director of Perso at the Air Ministry but retained his Naval rank during three years that he held this office. He was promote Vice-Admiral in June, 1921, and in December, 1921, he linquished his Air Ministry appointment and his post a additional Member of the Air Council and was placed on Retired List at his own request. He was made K.C.B 1920, for his services during the War.

COMMANDER ELLYSON, U.S.N.

On Feb. 27 Commander T. G. Ellyson, U.S.N., was, gether with two companions, drowned when an aeroplan which they were flying, fell into the sea while on a fl from Norfolk, Va., to Annapolis.

Theodore Gordon Ellyson was born at Richmond, Va. 1885, and he graduated from the U.S. Naval Academy in In 1910 when Mr. Glenn Curtiss offered to train one N officer in the art of flying, Lieut. T. G. Ellyson, then a marine officer, was detailed by the Navy Department to ceed to San Diego to learn to fly. On Jan. 11, 1911, the hydro-aeroplane school was established at North Island, Diego, Cal., and on Feb. 23, Lieut. Ellyson made the passenger flight in a hydro-aeroplane with Mr. Curtiss. was eventually granted the Aero Club of America lic No. 28, Military Aviator's certificate No. 26, and Navy A tor's certificate No. 1.

At this station Glenn Curtiss, in collaboration with L Ellyson, developed the first aeroplane to rise from, and on, either land or water and later Lieut. Ellyson succe in flying a Curtiss hydro-aeroplane from a wire cable an also made experiments which led to the development of compressed-air catapult.

In 1913 he took part in Fleet manœuvres at Guatan which is generally considered to mark the beginning of development of U.S. Naval Aviation.

In 1915 he returned to Naval duty and on the entry of United States into the War in 1917 he proceeded to Euro waters on anti-submarine work, being based at Plymout

In January, 1921, he returned to Naval Aviation as ex tive officer of the Naval Air Station, Hampton Roads, and in November of the same year he was transferred to post of Chief of the Plans Division, Bureau of Aeronauti

From December, 1922, to June, 1925, he was aviation m ber to the U.S. Naval Mission to Brazil.

In July, 1925, he was appointed to command Torpedo Bombing Squadron VT-1, U.S. Scouting Fleet, and earl 1927 he was appointed chief executive officer to the U. *Lexington,* the latest U.S. aircraft-carrier, which comm he was holding when he met his death on his forty-t birthday.

By his death the United States Navy has lost one o most valuable officers. And the fact that he was the pio of American Naval Aviation makes his death the lamentable.—L. B.

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AN AVRO COMMERCIAL MONOPLANE.

The Avro Type 610, a new commercial aeroplane now being built by A. V. Roe and Co. Ltd., is a five-seater saloon monoplane of 200 h.p. This machine, both in general arrangement and in construction, greatly resembles some of the recent American commercial monoplanes, whose excellent performances have attracted so much attention in this country.

British critics of these American machines have been prone to suggest that the secret of their success lay in the relative flimsiness of their construction. The Avro machine now in question is built to comply with British standard requirements for a Certificate of Airworthiness and is thus above criticism in this respect. It may therefore be looked on as an attempt to settle the question whether or not this particular type of monoplane has the advantages which are claimed for it.

The wings of this machine are of standard timber construction, attached to the top of the fuselage and braced by a pair of struts on each side running from the bottom of the fuselage to about half way out along the span. These struts are of steel-tube faired with Balsa wood. The ailerons, which are unbalanced, are built on welded steel tube frames.

The fuselage is a welded steel-tube structure, which at the engine mounting is circular, but assumes a rectangular section a little ahead of the leading edge of the wings, and tapers to a vertical edge at the sternpost.

The whole of the tail unit, which is of conventional form, is built on welded steel-tube frames. Neither rudder nor elevators are balanced.

The undercarriage has a very wide track. Each wheel is supported by three members. One of these is a telescopic leg, containing compression rubbers and an oleo dash-pot which runs vertically up to one of the front spar struts. A second is the axle—which bends up on the inner side of the telescopic leg and is hinged to the lower edge of the fuselage. The third member runs backwards and inwards from the junction of axle and telescopic leg and is hinged to the bottom of the fuselage below the rear spar.

The front spar bracing strut is supported above its junction with the undercarriage telescopic leg by a strut running inwards and upwards to the attachment of the front spar with the top rail of the fuselage.

Crew and passengers are entirely enclosed. The pilot's seat is ahead of the leading edge of the wings, and has a sloping wind-screen running up to the leading edge. This wind-screen is joined by side-windows which run up to the lower wing surface, and similar side-windows are built into the fuselage right back to the trailing edge.

Behind the pilot's seat are two pairs of side-by-side seats for passengers. Two side doors in the fuselage give access to the crew and passenger space.

The machine may be fitted with either the Armstrong-Siddeley Lynx IV engine, the new Bristol Titan I, or the Wright Whirlwind. All these engines are of approximately the same power and weight. Exhaust rings and presumably cabin-heater gears will be fitted to them. Petrol is carried in two aluminium tanks one on each side of the fuselage in the wings, which give a gravity feed to the carburetters.

Specification.

Dimensions.—Span 43 ft. 6 in. (13.25 m.), Length 27 ft. 6 in. (8.37 m.), Height 8 ft. 6 in. (2.59 m.), Wing area 266 sq. ft. (24.7 sq. m.).

Weights and Loadings.—Wing structure 490 lbs. (223 kg.), Fuselage 440 lbs. (200 kg.), Undercarriage and tail-skid 140 lbs. (64 kg.), Tail unit 80 lbs. (36 kg.), Power plant 650 lbs. (295 kg.), Total weight light 1,800 lbs. (816 kg.), Pilot 170 lbs. (77 kg.), Petrol (40 galls. = 182 litres) 300 lbs. (136 kg.), Oil (2½ galls. = 11 litres) 25 lbs. (11 kg.), Pay load (4 passengers) 680 lbs. (309 kg.), Total loaded weight 2,975 lbs. (1,350 kg.), Wing loading 11.8 lbs./sq. ft. (55 kg./sq. m.), Power loading (200 h.p.) 14.88 lbs./h.p. (6.75 kg./h.p.).

Performance (estimated).—Maximum speed 123 m.p.h. (198 km.h.), Minimum speed 55 m.p.h. (88 km.h.), Rate of climb (sea level 700 ft. (213 m.) per min., Climb to 5,000 ft. (1,525 m.) 8.7
to 10,000 ft. (3,050 m.) 23 mins., Service ceiling 13,300 ft. (4,05
Range at 110 m.p.h. and 2,000 ft. (600 m.) 4 hours = 440
(710 km.).

THE BEARDMORE INFLEXIBLE.

Those interested in big aircraft will be glad to hear
the Beardmore Inflexible (three 650 h.p. Rolls-Royce C
engines), which has been at Martlesham for some m
awaiting test, has flown, and flown well.

Piloted by Sq. Ldr. Noakes, she made her first fligh
Mar. 5. She got off easily in about 300 yards and pulle
in about 250 yards. She handles quite well and is
light on all controls.

The long delay in testing her has not been due to
defects in the machine, but solely by the weather. A mac
of such size costs a lot of money and obviously it would
been foolish to risk smashing it, either in trying to g
off the water-logged ground, or by trying to fly it in
weather before the controls had been properly tested in
flights.

Among the spectators at its first, and successful, f
were Lord Invernairn (formerly Sir William Beardmore),
sundry officers from the Staff College. The success of
Inflexible is a feather in the cap of the Rohrbach syste
construction, and great credit is due to Mr. W. S. Shackl
who embodied that system in successful modification of
Rohrbach design. Mr. Shackleton is now in Australia wh
he has gone to live, for the sake of his health. His
friends will congratulate him on this success.—C. G. G.

THE ARMSTRONG-SIDDELEY GENET.

As the result of a recent 100-hr. type test the Armstr
Siddeley Genet engine has been rated up from 65 h.p.
normal development of 80 h.p.

During the 100-hr. test a maximum of over 87 h.p.
obtained at 2,400 r.p.m. and the normal 80 h.p. was obta
at slightly over 2,100 r.p.m.

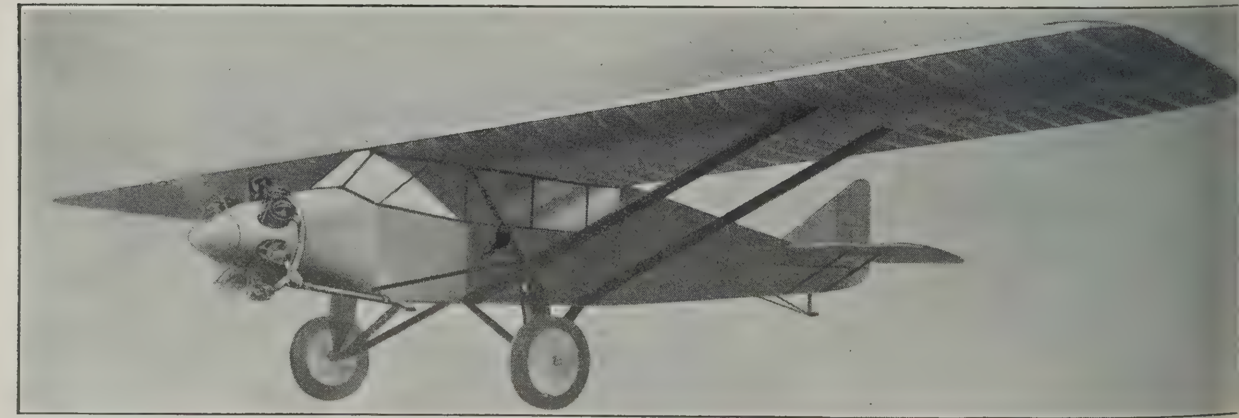
The Genet engine was introduced in 1926 for *The*
Mail Light Aeroplane Competition and is now being
successfully in Australia, Brazil, Canada, France and
countries. With this new increase of power the use of
engine should be still further extended for its design
many points to recommend it. The radial arrangement o
five cylinders makes for exceptional accessibility of the
and for very efficient cooling. It is also largely respon
for the fact that the complete engine scales under 200
The provision of five cylinders ensures a very even to
and the generally robust and rigid construction of the
accounts for its smooth running.

A GLOSTER SUCCESS IN JAPAN.

The Gloster Aircraft Co. Ltd. have been officially
formed that the Gloster Gambet (Bristol Jupiter eng
built and entered by the Nakashima Aircraft Works,
Gloster licensees in Japan, has won the Japanese single
shipboard fighter competition, and an order for additi
machines has been placed with the Nakashima comp
who also built the Bristol Jupiter engine under licence.

The award was made in competition with aircraft ent
by the Mitsubishi company and the Aichi Tokei Denki
pany, both of whose machines were fitted with the 500
Hispano-Suiza engine, and therefore the success of
Gloster and Bristol products in the face of aircraft
with engines of higher power is all the more notewo
and is an excellent testimony to the excellence of Br
aircraft and aero engines.

The Gloster Gambet was illustrated and described in
Aeroplane on June 1, 1927.



THE LATEST AVRO.—A drawing of the Avro 610 five-seater monoplane which is now under construction.

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B 38

THE ROYAL AIR FORCE.

The London Gazette.

Feb. 28.

Group Capt. A. Fletcher, C.M.G., C.B.E., M.C., is appointed Deputy Director of Organisation, Air Ministry, vice Group Capt. A. B. Burdett, D.S.O. (Feb. 15); Wing Cdr. C. G. Smith, O.B.E., is appointed Deputy Director of Equipment, Air Ministry, vice Group Capt. G. Laing, O.B.E. (Feb. 20).

General Duties Branch.—The following are granted S.S. comns. as Plt. Offs. for four years on the active list with effect from and with seniority of Feb. 14:—I. McL. Cameron, C. R. Clarke, G. E. Klein, J. H. Lindell, J. F. McKenna, D. T. Saville. The following Plt. Offs. are promoted to the rank of Flg. Off. (Jan. 30):—W. L. Freebody, K. S. Brake, L. C. Bennett, J. C. Cunningham, F. J. Moon.

The following are restored to full pay from half-pay (Feb. 22):—Sq. Ldr. J. J. Breen, Flg. Off. L. H. Anness.

Flt. Lt. J. R. F. Randell, D.F.C., is placed on the retired list at his own request (Feb. 29); Flt. Lt. E. H. Bryant is transferred to the Reserve, Class A (Mar. 1). The S.S. comn. of Plt. Off. on probation A. D. Jones is terminated on cessation of duty (Feb. 27).

Reserve of Air Force Officers.—General Duties Branch.—Flg. Off. P. R. Dawson is transferred from Class A to Class C (Feb. 28).

Auxiliary Air Force.—No. 601 County of London (Bombing) Squadron.—The following Plt. Offs. to be Flg. Offs.:—General Duties Branch.—H. N. St. V. Norman (Jan. 21). Accountant Branch.—D. H. W. Arnot (Oct. 29, 1927).

Appointments.

Week ending Mar. 5.

General Duties Branch.—Group Captain A. V. Bettington, C.M.G., to Home Aircraft Depot, Henlow, to command, 22/2.

Squadron Leaders A. Lees, to No. 56 Sqdn., North Weald, 7/2. W. H. Dolphin, to Aircraft Depot, India, 28/1. A. F. Brooke, to No. 28 Sqdn., India, 23/2. W. R. D. Acland, D.F.C., A.F.C., to R.A.F. Base, Calshot, 5/3.

Flight Lieutenants F. H. Laurence, M.C., to R.A.F. Base, Calshot, 5/3. H. Hackney, to R.A.F. Base, Calshot, 6/3. J. D. I. Hardman, D.F.C., to A. and G. School, Eastchurch, 29/2. E. F. Haylock, to R.A.F. Training Base, Leuchars, 1/3. H. C. Irwin, A.F.C., to R.A.F. Depot, Uxbridge, 1/3. C. E. V. Porter, to R.A.F. Training Base, Leuchars, 1/3. H. E. Forrow, to Wessex Bombing Area H.Q., Andover, 1/3. R. Jones, to School of Army Co-operation, Old Sarum, 3/3.

Flying Officers J. Sutherland, M.B.E., to Aircraft Park, India, 23/2. R. E. Bain, to No. 27 Sqdn., India, 23/2. (Hon. Flt. Lt.) I. A. Bertram, to No. 5 Sqdn., India, 23/2. F. S. O'Hanlon, to No. 8 Sqdn., Middle East, 23/2. C. G. Lucas, to No. 31 Sqdn., India, 23/2. A. Allen, to No. 8 Sqdn., Middle East, 23/2. A. G. Hill and J. H. Caulfield, to R.A.F. Training Base, Leuchars, 1/3. M. Wiblin, to R.A.F. Base, Gosport, 1/12. E. S. C. Vaughan, M.C., and S. G. Connolly, to A. and G. School, Eastchurch, 29/2. H. E. E. Weblin, to R.A.F. Base, Calshot, 5/3. E. R. Maddox, M.C., to R.A.F. Base, Calshot, 20/2.

Pilot Officers G. M. Buxton, to No. 20 Sqdn., India, 23/2. R. J. Carvell, to No. 28 Sqdn., India, 23/2. B. G. Farrow, to No. 28 Sqdn., India, 23/2. J. C. A. Johnson, to No. 5 Sqdn., India, 23/2.

Stores Branch.—Squadron Leader C. M. Bevan, to H.Q., Inland Area, Stanmore, 29/2.

Flying Officers A. G. Stratford-Tuke, to No. 3 Stores Depot, Milton, 28/2. C. Hanson-Abbott, to Air Ministry (Directorate of Equipment), 23/2. E. G. M. Charleson, to No. 208 Sqdn., Middle East, 14/2. E. A. Slater, to No. 5 Sqdn., India, instead of to No. 2 Wing H.Q., 7/1. A. G. Stratford-Tuke, to R.A.F. Base, Gosport, 9/1. A. E. Evans, D.F.C., to H.M.S. *Hermes*, 12/12.

Accountant Branch.—Flying Officer F. M. Hall, to No. 23 Group H.Q., Grantham, 8/3.

Medical Branch.—Flying Officer J. E. Foran, M.B., to Palestine General Hospital, 4/2.

The King's Levee.

His Majesty the King held a Levée at St. James' Palace on Feb. 28. Among those in attendance upon His Majesty was Air Marshal Sir John Salmond, Principal Air Aide-de-Camp. Group Captain P. F. M. Fellowes, Aide-de-Camp in Waiting was also among those present.

The following Officers of the R.A.F. were presented to the King by the Secretary of State for Air:—

Sq. Ldr. N. Anderson, Flg. Off. E. Andrewartha on appointment, Flg. Off. B. Barrett on appointment, Sq. Ldr. H. Crighton, M.B.E., Sq. Ldr. H. Edwards, Flt. Lt. J. Elliott on appointment, Wing Cdr. R. Field on promotion, Sq. Ldr. F. Fowler, D.S.C., A.F.C., on promotion, Sq. Ldr. H. Fraser, Flt. Lt. J. Glasher, D.F.C., on appointment, Flt. Lt. A. Goldie on appointment, Flg. Off. E. Groner on appointment, Flg. Off. A. Harvey, on appointment, Flt. Lt. R. Hill on appointment, Flt. Lt. W. Honey on appointment, Sq Ldr. G. Johnson, M.C., Flg. Off. P. King on appointment, Flg. Off. D. Mitchelmore on appointment, Flg. Off. F. North on appointment, Flt. Lt. S. Park on appointment, Flt. Lt. W. Purdin on appointment, Flt. Lt P. Rippon on appointment, Flg. Off. F. Swain on appointment, Flt. Lt. A. Wann on appointment, Sq. Ldr. A. Jones-Williams, M.C., on promotion.

Air Vice Marshal Sir Sefton Brancker, K.C.B., A.F.C., also attended the Levée and presented Major Herbert Brackley, D.S.O., D.S.C.

Fatal Accidents.

The Air Ministry regrets to announce that as the result an accident at Duxford to a Grebe machine of No. (Fighter) Sqdn., Duxford, on Mar. 1, 356240 Sjt. Herbe Trickett, the pilot and sole occupant of the aircraft, killed.

At the inquest on Mar. 2, Flg. Off. T. A. Hale-Munro said examined the machine the same morning, and it was in perfect orde Trickett was flying in flight formation, when, seeing an obstruction the aerodrome, witness signalled to him and another to turn awa Witness saw no more until after he had landed, when, on lookin behind, he saw Trickett in a vertical dive from which he did recover. Trickett had apparently lost flying speed. A verdict accidental death was returned.

The Air Ministry regrets to announce that as the result an accident at Isle of Grain to a Fairey III.F machine No. 207 (Bombing) Sqdn., Eastchurch, on Mar. 2, the pil of the aircraft, 327050 Sjt. William Bean Maltman, and passengers, 361877 AC.1. William George Lowman and 3636 L-AC. Sidney Cresswell Mason, were killed.

At the inquest at Eastchurch on Mar. on the victims of the Is of Grain accident, a verdict of accidental death was returned.

Flg. Off. L. A. Weedon said he ordered Sjt. Maltman to take machine up. He was to join in formation flying practice. When signalled to him to break away from formation he was to carry cloud flying practice. They took off at 25 minutes to 11. They we in formation for half an hour on the south side of the Medwa towards Rochester, getting back to the south of Sittingbourne at 11. At that time they were 3,000 ft. high. He (Flg Off. Weedon) gave signal to break away. He turned to the right and proceeded in southerly direction. That was the last he saw of him. During flight he observed the aeroplane, and everything appeared to normal. Maltman had done approximately 220 hours' flying as a pilo

Air Marshal Sir John Salmond.

The Air Ministry makes the following announcement:—

A request has recently been received from His Majesty's Governme in the Commonwealth of Australia for the loan of the services of senior officer of the Royal Air Force to advise them on the defence of the Commonwealth and on the organisation, training a equipment of the Royal Australian Air Force. Arrangements ha accordingly been made for Air Marshal Sir John Salmond, K.C. C.M.G., C.V.O., D.S O., A.D.C. (Air Officer Commanding-in-Chief, A Defence of Great Britain), to visit Australia this Summer.

Sir John Salmond is expected to arrive in Australia about the midd of June and will stay there about three months.

Air Marshal Sir John Salmond was born in 1881 a educated at Wellington and Sandhurst. He entered T King's Own Royal Lancaster Regiment in 1901 and serv in the South African War in 1901-2. He was promoted the rank of Captain in 1910.

He learned to fly on a Grahame-White biplane at Hend and his Royal Aero Club certificate, No. 272, is dat Aug. 13, 1912. He joined the Royal Flying Corps in 19 and was appointed an Instructor at the Central Flyi School in the same year. In May, 1914, he was appointed command the newly-formed No. 7 Squadron at Farnboroug In 1914 he was given Brevet rank of Major.

On Aug. 13, 1914, he went to France in command of No. Squadron, R.F.C., which command he held until April, 191 In June, 1917, having in due course commanded a Wing a a Brigade, he was promoted to the temporary rank of Majo General while commanding the Training Division, R.F. in England. In October, 1917, he was appointed to the Arm Council as Director-General of Military Aeronautics.

In February, 1918, he took over the command of the R.F. in the Field. He was promoted to the substantive rank Major-General in April, 1918, and commanded the R.A.F. France till the end of hostilities.

He was appointed a Companion of the Distinguished Servi Order in February, 1915, a Companion of the Order of S Michael and St. George in June, 1917, a Commander of t Victorian Order in August, 1918, and a Knight Command of the Bath in January, 1919.

His foreign decorations include the Legion of Honour, t Croix de Guerre (France), the Croix de Guerre (Belgium the Order of Leopold (Belgium), the Order of the Whi Eagle (Russia), the Order of the Crown of Italy, and t American Distinguished Service Medal.

He was promoted to the rank of Air Vice-Marshal August, 1919, and appointed Air Officer Commanding t Inland Area, R.A.F., in 1920. In 1922 he was appointed command the British Forces in 'Iraq and was promoted the rank of Air Marshal in June, 1923.

In January, 1925, he was appointed Air Officer Comman ing-in-Chief, Air Defence of Great Britain, on the formati of that Command. He was appointed Air A.D.C. to the Ki in February, 1925.

SOME UNEQUALLED PERFORMANCES.

REGULARITY-SECURITY-ENDURANCE

LORRAINE AERO ENGINES.

Rome-Melbourne-Tokyo (54,000 km.) by Colonel de Pinedo and Campanelli (450 h.p. motor).
The Tour of Europe (7,500 km.) in 61 hours from start to finish, by Arrachart and Carol (450 h.p. motor).
Warsaw-Tokyo-Warsaw (20,250 km.) in 130 hours, by Lieut. Orlinski (450 h.p. motor).
Paris-Pekin (10,500 km.) in 6 days, by Pelletier Doisy and Carol (450 h.p. motor).
Circuit of the West Mediterranean (6,000 km.) in 41 hours 50 mins. from start to finish, by Pelletier Doisy and Gonin (450 h.p. motor).
Night Crossing of the South Atlantic, by Colonel Sarmento de Beires (450 h.p. geared motor).
Paris-Bombay-Belgrade (14,500 km.) in 89 hours flying time by Sondermayer and Baydak (450 h.p. motor).
Circuit of Eastern Europe (8,000 km.) in 7 days by Commandant Weiss and Assolant (450 h.p. geared motor).
Circuit of the Mediterranean (10,700 km.) in 6 days by Pelletier Doisy and Gonin (650 h.p. geared motor).
Michelin Cup, 1925 (Captain Pelletier Doisy), 1927 (Capt. Challes).
Breguet Cup, 1925 (Adjt. Sahuc), 1926 (Adjt. Duroyon).
King of Servia's Cup, 1926 and 1927.

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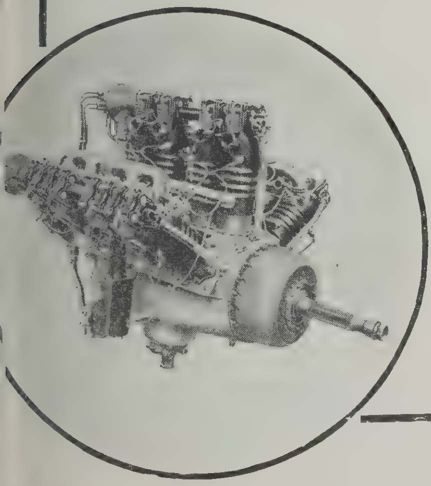

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Promotion in the R.A.F.

An Air Ministry Order dated Feb. 14, 1928, deals with the promotion of Officers of the General Duties Branch. The order will come into operation after the Promotion List of July 1 next. The scheme does not apply to officers who are permanently unfit or are unqualified for duty as pilots or to officers seconded from the other Services.

The guiding principle of the scheme is a system of antedates whereby seniority will be weighted so as to give earlier promotion to officers who have acquired certain specialist and other service qualifications and to officers who are recommended as specially suitable. Future promotion will be made in accordance with this principle subject to certain qualifications which are enumerated as follows :—

Qualifications for promotion to Flight Lieutenant.—Before a Flying Officer can be promoted to Flight Lieutenant he must :—(i) be within the zone of promotion (this zone will for the present comprise officers of not less than 3 years' service as Flying Officer). (ii) have served for 2 years as Flying Officer in a flying unit. (iii) have passed promotion examination B. (iv) have been recommended by his A.O.C.

Qualifications for promotion to Squadron Leader.—Before a Flight Lieutenant can be promoted to Squadron Leader he must :—(i) be within the zone of promotion (this zone will for the present comprise officers of not less than 5 years' service as Flight Lieutenant). (ii) have passed, or been excused promotion examination C. (iii) have been recommended by his A.O.C.

The Air Ministry Order goes on to state that the Air Council attach great importance to a high proportion of permanent officers specialising and beginning their specialist training after four years' service.

Other qualifications which will receive recognition under this scheme are (for promotion to Flight Lieutenant) flying instructor, (for promotion to Squadron Leader) graduate of a Staff College and (for promotion to both ranks) interpreter in Eastern languages. Officers who combine specialist with other recognised non-specialist qualifications will be allowed to count antedates in respect of each qualification.

The purpose of the "recommended" antedate, that given on the recommendation of the A.O.C., is to give early promotion to exceptionally able and promising officers.

Officers will gravely jeopardise their prospects if they have not passed their promotion examinations before the date on which they would otherwise be promoted.

Lists of Flying Officers and Flight Lieutenants qualified for promotion will be compiled and maintained at the Air Ministry and the order of the names on the lists will be re-arranged from time to time in accordance with seniority as modified by the following scale of antedates :—Flying Officers : (a) If specially recommended by A.O.C. 6 or 12 months ; (b) if qualified for symbol E (qualified Engineering officer), 12 months ; (c) if qualified for symbol S (qualified Signals officer), A (qualified Air Armament officer), Ph. (qualified Photographic officer) or N (qualified Air Navigation officer), 6 months ; (d) if qualified as Flying Instructor, Grade A, 12 months ; (e) if qualified as Flying Instructor, Grade B, 6 months ; (f) if qualified as Interpreter, Class 1, in Japanese, Arabic, Persian, Turkish or Russian, 6 months.

Antedates on this scale will be subject to a maximum total antedate of 24 months for any one officer.

Officers will be granted antedate in respect of only one qualification under categories (b) and (c) and of only one qualification under category (f).

The qualification list for Flight Lieutenants is as follows :—(*a*) If specially recommended by A.O.C. 6, 12, 18, 24, 30 or 36 months ; (*b*) if qualified for symbol E (University course in Aeronautical Engineering), S (University course of Electrical Engineering, etc.), or A (Woolwich course of Armament), 24 months ; (*c*) if qualified for symbol E, S, A, Ph. or N, 12 months ; (*d*) if qualified as Interpreter, Class I, in Japanese, Arabic, Persian, Turkish or Russian, 12 months ; (*e*) if qualified *p.s.a.* or *q.s.*, 12 months.

(1) Antedates on this scale will be subject to a maximum total antedate of 48 months for any one officer.

(2) Officers qualified for antedate under category (*b*) who have received antedate in respect of E, S or A qualifications on promotion to Flight Lieutenant will receive only the difference between 24 months and the previous antedate.

(3) Officers, qualified for antedate under categories (*c*) or (*d*), who have received antedate in respect of one of these qualifications on promotion to Flight Lieutenant, will receive only 6 months antedate in respect of the same qualification for promotion to Squadron Leader.

(4) Antedate will be granted in respect of only one qualification under category (*c*) and in respect of only one qualification under category (*d*).

Officers will be promoted in turn from the lists maintained at the Air Ministry provided they are judged by the Air Council to be suitable for promotion.

Flying Officers and Flight Lieutenants not qualified for promotion under this Order after a reasonable period of service in their rank will be the subject of periodical review by the Air Council and will be warned that failure to qualify within a stated further period will involve the consideration of their retention in the service. If still not qualified at the expiration of that period they will normally, if Flying Officers, be retired on the ground of unsuitability and if Flight Lieutenants be placed on half-pay, Scale B.

Flying Officers and Flight Lieutenants not judged suitable for promotion when reaching their turn for promotion will be relegated for consideration for promotion at a later date. If still not judged suitable after a period varying according to the circumstances of the case they will normally, if Flying Officers, be retired on grounds of unsuitability, and if Flight Lieutenants be informed that they are permanently passed over for promotion but will be retained until retired for age.

The conditions of promotion to Flying Officer will remain unchanged.

The conditions of promotion to Wing Commander and higher ranks will be continued to be made half-yearly on the basis of selection as at present. It will also be considered from time to time whether any officers should be permanently passed over for promotion. When it is decided to do this in the case of any officer, he will be so informed.

The Wahabi Raids.

The Times correspondent at Basrah in a message dated Mar. 2 states :—

Preparations are being made to cope with the further severe conflicts with the Wahabis which are expected, for Sheikh Ibn Hamid, leader of the powerful Ataibah tribe, is reported to be mustering 20,000 men for an attack on South 'Iraq and Koweit. An armoured train is now running between the Royal Air Force base and the Imperial Airways Station at Shaibah, near Basrah, and the advanced base at Ur of the Chaldees. A new air base has been established at Koweit, where H.M.S. *Emerald* and the sloops of the British patrol in the Persian Gulf are lying awaiting events. I understand that the Wahabi King has formally protested to the 'Iraq Government against the action of the Royal Air Force in attacking the raiders at Bires Safa on the ground that it infringed the international agreement.

The presence of Ibn Hathlein, Sheikh of the Ajman, who ordinarily lives in the Sarrat, in the last big raid into 'Iraq suggests to some that the Ajman tribe is not uninterested in the activities of the Mutair. Sheikh Feisal ed Dowish's mother is the daughter of one of Ibn Hathlein's predecessors as Sheikh of the Ajman.

A *Reuter* message dated Mar. 1 states :—

The Royal Air Force is engaged daily in its campaign in the desert, but the difficulties of detecting the raiders are enormous, owing to mirage and sandstorms. The total number of Wahabi raiders killed by the Royal Air Force by bombs and rifle fire during the past fortnight is estimated at 800.

The Far East Cruise.

The following telegram has been sent by the Secretary of State for Air to Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., Officer Commanding the Far East Flight, R.A.F., on the arrival of the Flight at Singapore :—

I warmly congratulate you and all under your command on the highly successful completion of the first 11,000 mile stage of your flight. The punctuality with which you have adhered to your timetable reflects the greatest credit on all concerned and demonstrates convincingly the important rôle which the flying-boat can fulfil in the Empire both for defence purposes in time of war and in developing air communications in time of peace.

In the course of an interview at Singapore Group Capt. Cave-Browne-Cave said that the flying-boats would be overhauled at Singapore and would remain there until the middle of May. They would then proceed to Australia, returning to Singapore later. Afterwards they would visit Hong-Kong. The flight had been most successful and uneventful. It was purely a Service effort, and reports had been made on various seaplane bases visited *en route*. The duralumin hulls were standing the strain well and were not uncomfortably hot except when there was no breeze. The engines were in excellent condition.

Cape—Cape Town—Cairo.

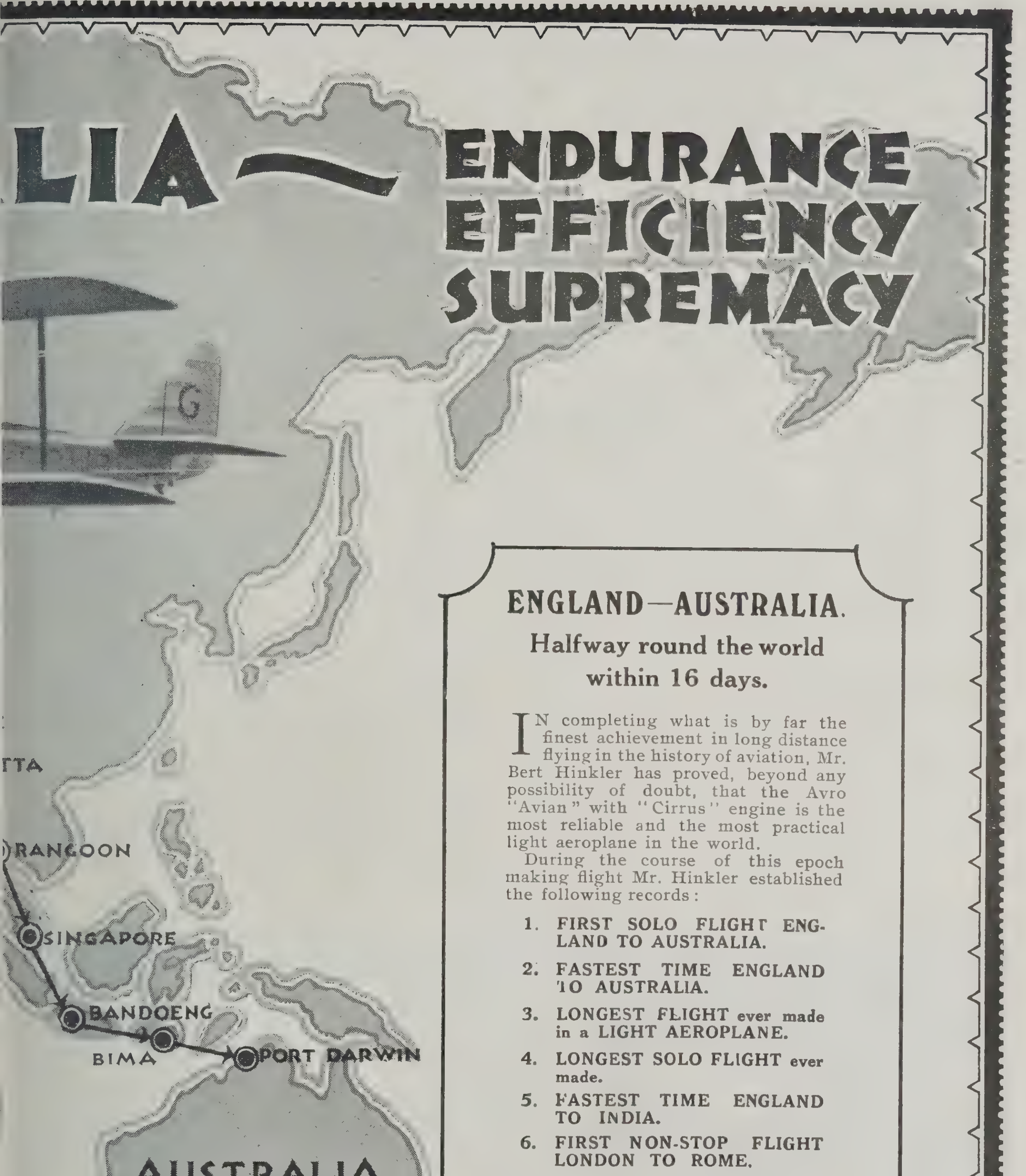
On Mar. 1 a flight of four Fairey III.F biplanes (450 h.p. Napier Lion engines) left Cairo on the annual Cairo—Cape Town—Cairo flight under the command of Air Vice-Marshal T. I. Webb Bowen, C.B., C.M.G.

Aircraft Carriers.

H.M.S. *Hermes* will remain at Hong-Kong on Mar. 19 to relieve H.M.S. *Argus* which will leave there on Mar. 20 and return to Portsmouth for refit before joining the Atlantic Fleet. Her return programme is as follows :—Singapore Mar. 25-26, Colombo Apr. 1-3, Bombay Apr. 6-9, Aden Apr. 15, Port Said Apr. 21-22, Malta Apr. 25-28, Portsmouth May 5.

R.A.F. Chaplains.

An Air Ministry Order states that to avoid misunderstandings it is now notified that Chaplains are eligible to fly as passengers and if physically fit may be ordered to do so, if, for example, for reasons of urgency it is necessary for the due performance of their Service duties that they should proceed by air.



ENGLAND—AUSTRALIA.

Halfway round the world within 16 days.

IN completing what is by far the finest achievement in long distance flying in the history of aviation, Mr. Bert Hinkler has proved, beyond any possibility of doubt, that the Avro "Avian" with "Cirrus" engine is the most reliable and the most practical light aeroplane in the world.

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WRITE FOR DETAILS & PRICE

The R.A.F. Staff College Re-union.

The fourth annual re-union dinner of the R.A.F. Staff College will be held at the Savoy Hotel on Mar. 23 at 19.30 hours for 20.00 hours.

Air Vice-Marshal Sir Robert Brooke-Popham, K.C.B., C.M.G., D.S.O., A.F.C., will be in the Chair and the Guests will be Marshal of the Royal Air Force Sir Hugh Trenchard, G.C.B., D.S.O., and Colonel the Hon. M. C. A. Drummond, C.M.G., D.S.O.

The R.A.F. Dinner Club.

The annual dinner of the R.A.F. Dinner Club will be held on June 29.

R.A.F. SPORTS AND PASTIMES.

Rugby Football.

Royal Air Force versus Oxford University :—The R.A.F. were beaten by Oxford University at Halton on Feb. 29 by two goals and three tries (19) to two goals and one try (13). The R.A.F. points were all scored in the first twenty-five minutes of the game and were almost entirely the work of the forwards. Then the Oxford team, who had been in a semi-somnolent condition during this stage of the proceedings, pulled themselves together and maintained a steady improvement until the end of the match and the R.A.F. never looked like scoring again although towards the end Beamish, who was handicapped by lameness, made several desperate efforts to rally the exhausted pack.

D. L. Maclean, the Worthy Down scrum-half, played his first game for the R.A.F. and proved again that a good member of a Station team has not necessarily had enough experience of first-class Rugger to make a good member of the R.A.F. representative side. Maclean is an energetic, hard-working scrum-half, but he continually picks the ball out of the scrum, is too frequently off-side and lacks judgment in timing his passes. The last fault may have been caused in this game by the fact that he was playing with a strange stand-off half as one does not remember this weakness when he was playing with Odbert in the Cup Final last year. But unfortunately the Powers-that-be had decided to have a Promotion examination on Feb. 29 which kept the R.A.F. Captain off the field.

Less than five minutes from the start of the game, Adams headed a forward rush by the R.A.F. and scored a try from the scrum on the Oxford line. Coote converted. A threequarter attack broke down through bad handling. Hale-Munro mis-fielded a high ball and then mis-fielded the subsequent free kick. Maclean gathered the ball from a scramble near the Oxford goal and tried to sell a dummy, but Oxford were not buying any. A scrum was formed and Maclean slipped round to score a try. Coote converted again. The R.A.F. gave away a number of penalties at this stage but the good hooking and heeling of the forwards in the scrum and their vigour in the loose kept the game in enemy territory. Maclean made a good break away from a scrum but passed too late. Adams finished off a brisk forward movement by a try far out. The goal kick failed.

Up to this point the Oxford team were showing about as much appreciation of the qualities of their opponents as the University authorities have shown to the existence of Aviation, but thirteen points against them was worthy of the notice of even Oxford and they began to show signs of animation.

Coote found touch with a beautiful kick from a penalty. Norwood was taking some very difficult passes and kicking with good judgment but the Oxford pressure steadily increased. After a good tackle by Bremridge the ball went loose and was gathered by Hume, the Oxford inside right and passed out to the wing. The Oxford three-quarters travelled at top speed and their handling was faultless. Lusty got over the line and then converted his own try.

The second half started with another Oxford try by the same Hume-Lusty combination but it was not converted. The Oxford forwards began to get the ball and Hume, Alexander and Lusty brought off a third try, Alexander scoring. Hodder stopped an Oxford forward rush by making a mark and another Oxford attack failed when Taylor slipped when going at high speed down the wing. Hume started another good move from a drop out and getting the ball again punted ahead for Walker to gather and score.

By this time the Air Force forwards were beginning to show signs of distress and although both Beamish and Adams broke away several times they were not given enough support to enable them to repeat their early successes. They were both right on the line once when they were smothered by the Oxford backs. A short Air Force three-quarter movement went across the field but gained no ground. A last burst by the Air Force forwards was driven back by a fine kick by the Oxford full-back, Keete, and from the line-out Lusty got away again. The kick at goal hit the post.

Tte R.A.F. team were:—Flg. Off. T. A. Hale-Munro, back; AA. P. B. Coote, Plt. Off. J. R. H. Pott, Flg. Off. F. S. Hodder and Flg. Off. C. H. G. Bremridge, three-quarter backs; Plt. Off. J. Norwood and Plt. Off. D. L. Maclean, half-backs; Flt. Lt. C. J. S. O'Malley, F-S. G. F. Cockell, Sjt. A. C. Hall, Plt. Off. H. A. Constantine, Flt. Lt. C. D. Adams, Cpl. M. G. Christie, Flg. Off. G. R. Beamish and Plt. Off. J. Clarke, forwards.

Halton is to be highly congratulated on its playing fields. One does not believe that there are many Rugger grounds in the country in a better state than the one on which this game was played. Several hundreds of aircraftmen and aircraft apprentices watched the game and cheered both sides with a sporting impartiality.—C. M. McA.

R.A.F. versus Northampton :—The R.A.F. were beaten at Northampton on Mar. 3 by Northampton by a goal and two tries to a try. The R.A.F. try was scored by Plt. Off. J. R. H. Pott after a long run down the field.

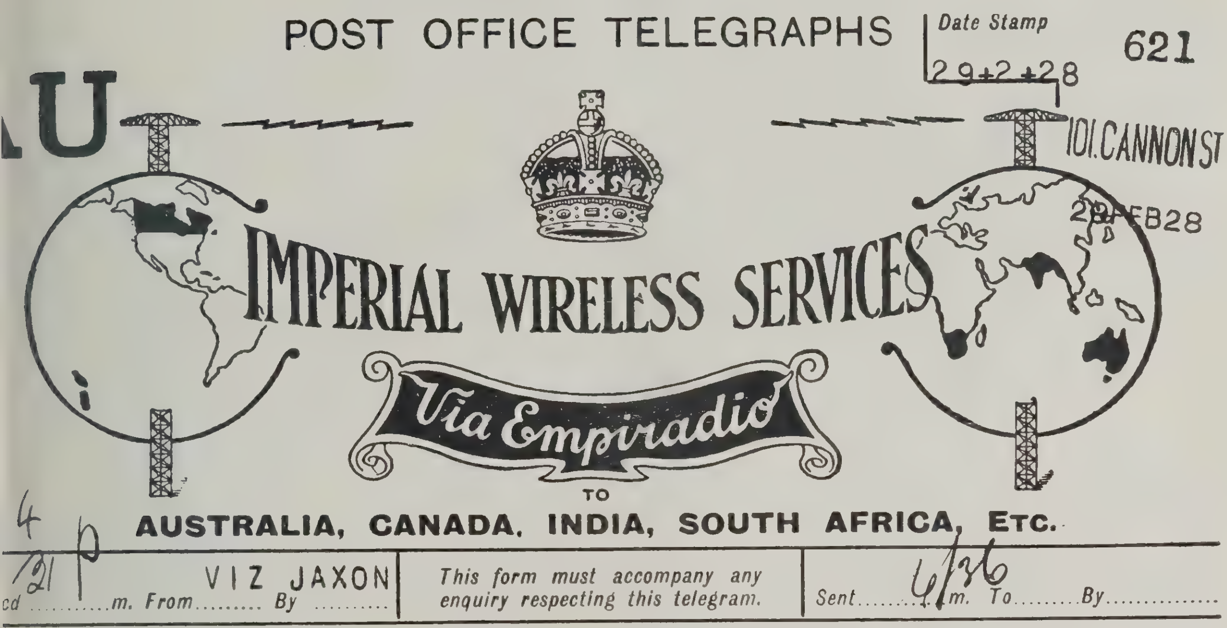
The Daily Telegraph report of the game states :—

The R.A.F. forwards always used their feet well in the loose, and some of the strong combined rushes, in which Beamish, Chick, and Chichester figured prominently, wanted a lot of stopping. Outside, too, the Airmen showed rather better combination than the home backs, but, the Northampton forwards following up quickly and marking very accurately, the Air Force centres experienced great difficulty in getting the ball out to their wings.

Odbert, at outside half, worked untiringly, and he was well supported by Hodder and Pott; but neither Bremridge nor Waghorn had much chance of showing their powers. Hale-Munro fielded accurately, and kicked with good judgment. On both sides the tackling reached a high standard.

R.A.F.—Flg Off. T. Hale-Munro; Flg. Off. C. H. G. Bremridge,

HOCKEY.—The R.A.F. and R.N. representative Hockey teams taken before their match on Feb. 29, when the R.N. won by one goal to nothing.



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Association Football.

R.A.F. versus Civil Service.—The R.A.F. beat the Civil Service at Chiswick on Feb. 29 by three goals to two. The Civil Service were stronger in defence but the pace and determination of the R.A.F. forwards pulled them through. AC. Dicken started the scoring with a left foot screw shot from close in. The Civil Service equalised with a hard shot by F. E. Behn but the R.A.F. scored another goal before half-time.

AC. Smith scored five minutes after half-time with a left foot drive on the half volley and J. Casey scored from close in after clever combination work by the Civil Service. The R.A.F. were in defence from this point until the end of the match.

The R.A.F. team were :—AC. L. W. Quadling, goal; Cpl. R. A. Eager and Flt. Lt. S. N. Webster, A.F.C. (captain), backs; Sjt. R. Stewart, Cpl. R. W. Baldwin and Flt. Lt. B. Ankers, half-backs; Sjt. E. Francis, AC. L. Oates, AC. A. Dicken, AC. L. S. Smith, and AC. G. Ward, forwards.

Hockey.

R.A.F. versus R.N.—The R.A.F. were beaten by the R.N. at Merton Abbey by one goal to nil on Feb. 29.

The Navy had the better of the first part of the game and Cpl. Butler saved well twice in succession. Combined play between the Navy's half-backs and forwards gave Cdr. Mackenzie a good opening to score about a quarter of an hour from the start.

A good run and centre by Flg. Off. Vines early in the second half was stopped by sticks. A shot at goal after a combined Naval movement went wide. Flg. Off. Vines had one very fine chance towards the end from a centre but he failed to steady himself and the ball went over the goal.

The R.A.F. team were :—Cpl. C. Butler, goal; Sq. Ldr. F. J. Murphy and Cpl. L. G. Beeton, backs; Flg. Off. R. M. Thomas, L-AC. W. C. Maker and L-AC. C. Crowther, half-backs; Flg. Off. C. D. Vines, AA. MacCusworth, Flt. Lt. F. F. Inglis, Flt. Lt. H. N. Hampton and AA. C. Stevenson, forwards.

The Individual Boxing Championships.

The R.A.F. Individual Boxing Championship Meeting was held at Halton on Feb. 29 and Mar. 1.

The Boxing correspondent of *The Times* wrote :—

> The general impression gained from watching both the officers and the airmen's finals was that steadiness and straight hitting, as opposed to wild rushing and swinging, were the things that mattered most in R.A.F. boxing. Perhaps there was little brilliance, but at least the basis of effective fighting was there. It was significant that even when the boxers tired there was a brave attempt made to drive home punches from the hip and shoulder rather than from distant parts of the earth. Admittedly, there were few knock-out blows landed, but that was where the steadiness in defence as well as in attack came in. Incidentally, steadiness enables boxers who never, perhaps, can hope to be fighting geniuses of the type of Jimmy Wilde to hit with the knuckles instead of the open glove, the most besetting sin of modern times.

The results of the semi-finals and finals were :—

AIRMEN.

Fly-weights.—SEMI-FINAL : AC. Palmer (Halton) beat AC. Mudd o points.

FINAL : Cooper beat Palmer on points.

Bantam-weights.—SEMI-FINAL : L-AC. Williamson (Henlow) beat A Black (Sealand) on points.

FINAL : Williamson beat Johnson on points.

Feather-weights.—SEMI-FINAL : AC. Fairclough (Halton) beat A Powell (Calshot) on points; Cpl. Blaze (Halton) beat AC. Borlan (Digby) on points.

FINAL : Blaze beat Fairclough on points.

Light-weights.—SEMI-FINAL : L-AC. Clarke (Digby) beat AC. Scroggin (Manston) in the second round; AC. Garrett (Henlow) beat AC. Wils (Worthydown) on points.

FINAL : Garrett beat Clarke on points.

Welter-weights.—SEMI-FINAL : AC. Buchanan (Manston) beat AC Ballantyne (Flowerdown) on points; Cpl. Brady (Worthydown) bea Cpl. Cockburn (Leuchars) on points.

FINAL : Brady beat Buchanan on points.

Middle-weights.—SEMI-FINAL : Sjt. Higgins (Netheravon) beat A Scully (Gosport) on points; AC. Rollason (Leuchars) beat AC. Clap (Halton) on points.

FINAL : Higgins beat Rollason (holder) on points.

Light-heavy-weights.—SEMI-FINAL : AC. Mather (Lee-on-Solent) bea AC. Thomas (Upavon) in the first round; AC. Mockley (Henlow) bea AC. Christian (Manston) on points.

FINAL : Mather, w.o.; Mockley, scratched.

Heavy-weights.—SEMI-FINAL : AC. Forrester (Cranwell) beat AC Higgins (Calshot) on points; AC. Jones (Aldergrove) beat AC. Robinso (North Weald) in the third round.

FINAL : Forrester beat Jones in the second round.

OFFICERS.

Feather-weights.—FINAL : Flg. Off. Watkins (Old Sarum) beat Plt. Of Haxeldine (Digby) on points.

Welter-weights.—FINAL : Flg. Off. Loughman (Catterick) beat Plt. Of de Courcey Wheeler (Digby) on points.

Middle-weights.—SEMI-FINAL : Flg. Off. Baxter (Shrewsbury) beat Plt. Off. Warner (Digby), who retired in the second round; Plt. Off Maclean (Worthydown) beat Flg. Off. Underdown (Old Sarum) o points.

FINAL : Maclean beat Baxter on points.

Light-heavy-weights.—FINAL : Flg. Off. Thorn (Farnborough) bea Flg. Off. Bell (Old Sarum), who was disqualified for hitting low, afte Thorn had slipped, in the first round.

Heavy-weights.—SEMI-FINAL : Flg. Off. Chichester (Manston) (holder beat Plt. Off. Dillon-Tranchard (North Weald) on points; Flg. Of Beamish (Bicester), w.o.; Flg. Off. O'Callaghan (Worthydown), wh scratched, owing to sickness.

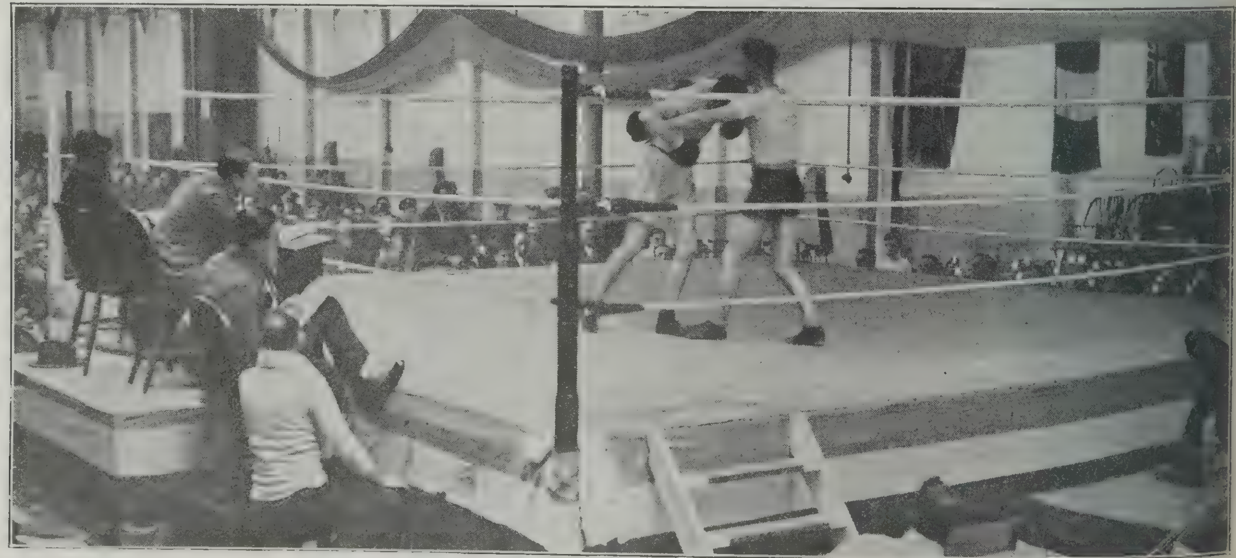
FINAL : Chichester beat Beamish in the third round.

THE RED AIR FLEET.

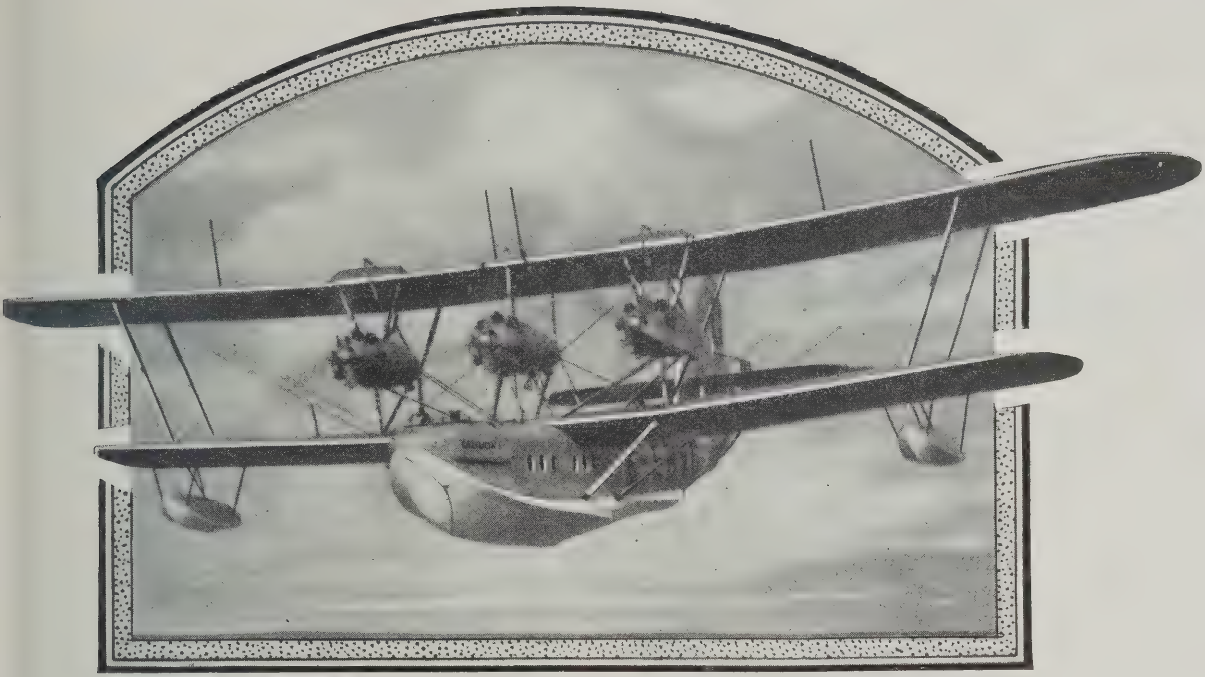
According to a *Reuter* message, a Soviet report from Moscow reports that on Mar. 4, 15 aeroplanes of the 66 which are being built with money collected in connection with the tenth anniversary of the Red Army were handed over to the Air Fleet. Speeches were made describing the "Flotilla Fund" as the "Soviet reply to Chamberlain."

THE AFGHAN AIR FORCE.

According to the New Delhi correspondent of *The Daily Telegraph*, the Afghan aviation students who have been training in Russia have now returned to Afghanistan, where they have replaced Russian pilots in the Afghan Air Force. Eleven more aviation students are about to be sent abroad, this time to Rome, by arrangement with the Italian Government.



THE INDIVIDUAL CHAMPIONSHIPS.—A clinch during the bout between AC. Ballantyne (Flowerdown) and AC. Buchanan (Manston) in the Welter-Weights at Halton on Feb. 29.



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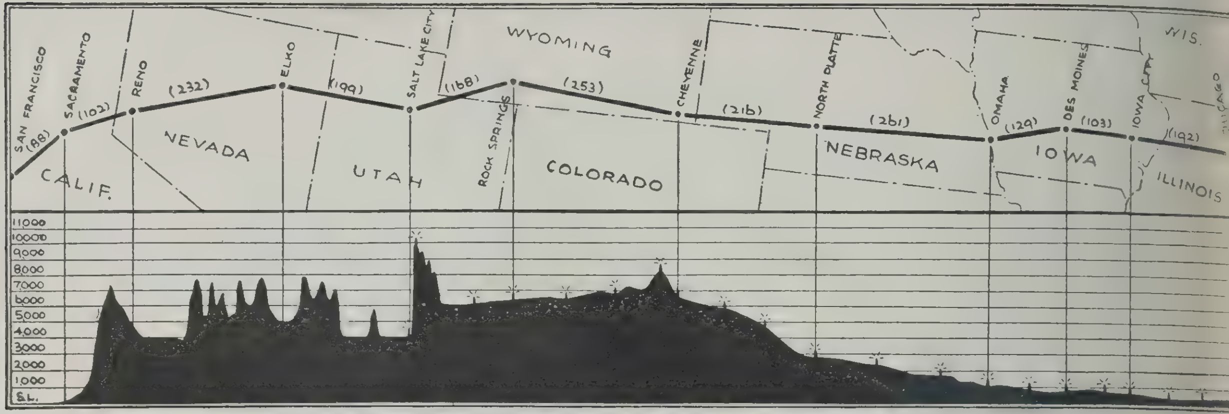


CHICAGO—SAN FRANCISCO.—A route and contour map of the air mail route operated by Boeing Air Transport Inc. once in each direction every 24 hours.

Boeing Air Transport, Inc., was incorporated in 1927 with a capital of $750,000 (£150,000) as a subsidiary of the Boeing Airplane Co., of Seattle, Wash., the well-known aircraft constructors.

The Corporation was awarded the contract for the operation of the Chicago—San Francisco division of the Transcontinental Air Mail Service, a distance of 1,949 miles, which had hitherto been operated by the Post Office Department, this service beginning on July 1, 1927.

The contract called for one journey each way daily, the westbound service leaving Chicago at 19.50 hours with stops at Iowa City, Des Moines, Omaha, North Platte, Cheyenne, Rock Springs, Salt Lake City, Elko, Reno and Sacramento, arriving at San Francisco at 16.50 hours the next afternoon. The eastbound service leaves San Francisco at 07.00 hours and arrives at Chicago at 05.45 hours the next morning.

The route from Chicago to Salt Lake City is completely lighted for night flying. The night flying equipment consists of one 5,000,000 candle power incandescent electric beacon, with a penetration of from 60 to 75 miles, situated at 25-mile intervals on emergency landing fields throughout the lighted portion of the route. In between at three-mile intervals there are installed 5,000 candle power acetylene gas flashing beacons visible from 6 to 9 miles. The boundaries of all landing fields as well as buildings or other obstructions are illuminated.

There is wireless communication along the entire route.

At most stops on the route the landing fields are municipally owned and the hangars are provided by the various cities for the air mail.

The personnel, under the management of Mr. Hubbard, who is assisted by Mr. B. D. Collyer, formerly General Superintendent of the Post Office Air Mail Service, consists of pilots and mechanics who were previously in the em
of the Post Office.

The original equipment consisted of 25 Boeing Mail pl
specially designed and built for the service.

THE BOEING MAIL PLANE.

The Boeing Mail Plane is a single-engine tractor bip
fitted with the 425 h.p. Pratt and Whitney Wasp eng

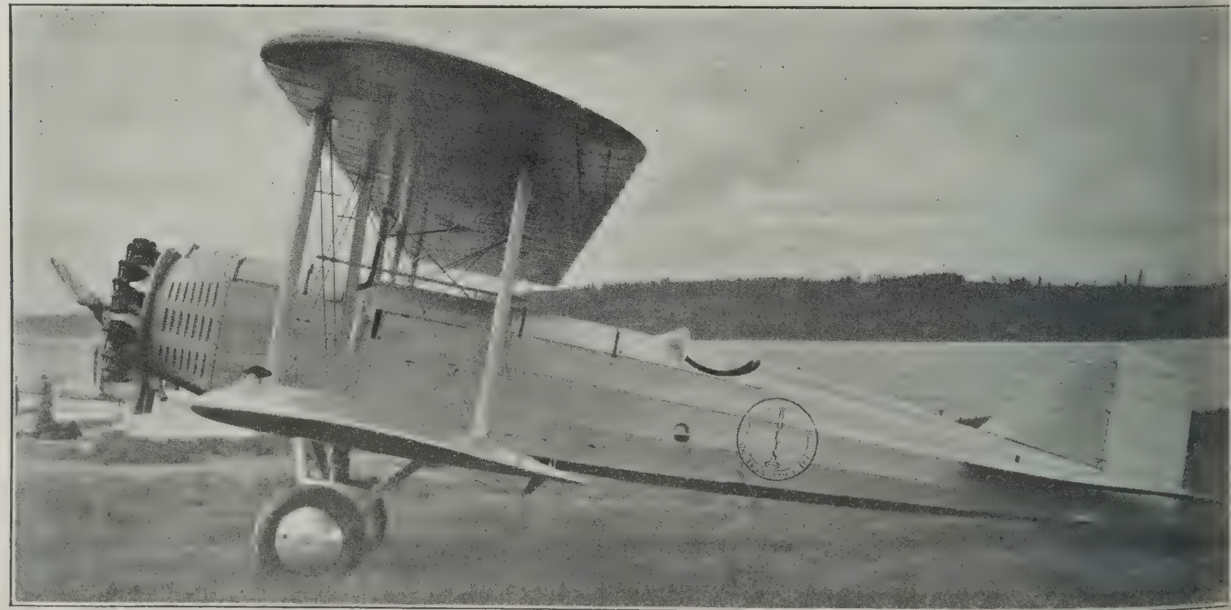
It follows standard American practice in having a we
steel tube fuselage and wooden wings.

Immediately behind the engine is a mail compartment
a capacity of 25 cubic feet. Behind this, and under the w
is a passenger compartment with accommodation for
The cabin is comfortably furnished, is provided with
doors one on either side, each fitted with sliding g
windows, and provision is made for forced ventilation
heating. This cabin, with the seats removed, has a capa
of 34 cubic feet and can be used for extra cargo or
space if it is desired. Behind the cabin is a further
compartment with a capacity of 36 cubic feet. Both the re
lar mail compartments are metal-lined and are provided
hinged metal covers secured by external straps.

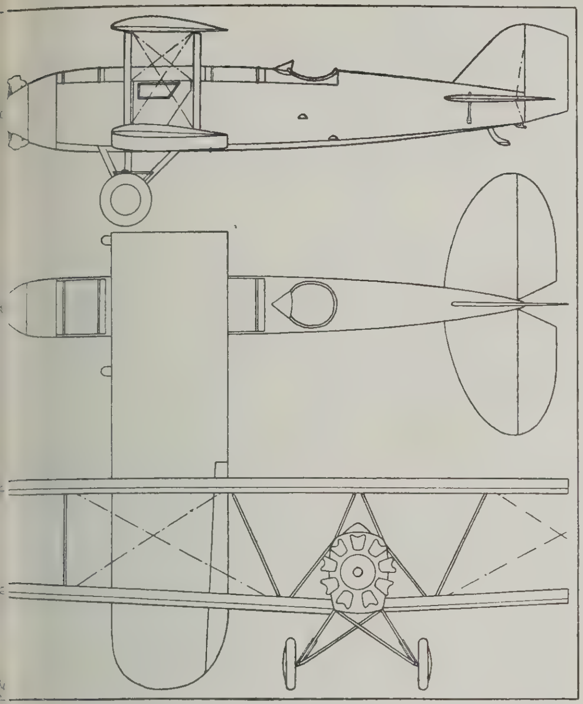
The pilot's cockpit is behind the rear mail compartm
and is situated about midway between nose and tail.

The petrol is carried in two tanks, one of 60 gal
capacity in the fuselage between the front mail compartm
and the cabin and the other of 40 gallons capacity in the
plane. Petrol feed is by gravity from the wing tank an
hand pump is provided for use if the normal pressure p
fails to raise the petrol from the fuselage tank to the
tank.

An engine-driven generator and storage battery pro
electric current for lighting and for operating an elec



THE BOEING MAIL PLANE.—A single-engined mail carrier, fitted with the Pratt and Whitney Wasp engine, which has accommodation for two passengers and 1,600 lbs. of mail matter.



ia engine-starter. Complete night-flying equipment is ded.

pressure fire-extinguisher covering both the engine and l tank compartments is controlled by the pilot, and hand guishers are provided in both the cabin and the pilot's it.

e wings are of the simplest wood construction, the spars of solid spruce, routed for lightness wherever possible. arrangement of the external bracing is shown in the ral arrangement drawing.

e tail-unit is of the standard Boeing outline and the rcarriage is of the split axle-less type. The two bent are attached to the bottom longerons of the fuselage re crossed so as to lessen the amount of bend.

enty-five of these machines have been constructed for g Air Transport Inc., and they are giving every satis- n in service.

SPECIFICATION.

...... 44 ft. 2¼ ins. (13.47 m.)	Nominal pay load per h.p. 3.9 lbs./h.p. (1.77 kgs./h.p.)
h 33 ft. 3-3/16 ins. (10.14 m.)	Speed, max. 135 m.p.h. (216 km.p.h.)
t ... 11 ft. 7½ ins. (3.54 m.)	Speed, stalling 54 m.p.h. (86.4 km.p.h.)
area 545 sq. ft. (50.68 sq. m.)	Climb at sea level 770 ft. per min. (234.85 m. per min.)
t loaded (1,600 lbs. pay load) 5,600 lbs. (2,542.4 kgs.)	Climb to 10,000 ft. (3,050 m.) 19.5 mins.
loading s./sq. ft (49.46 kgs./sq. m.)	Service ceiling 15,000 ft. (4,575 m.)
loading 7 lbs./h.p. (6.21 kgs./h.p.)	

SIX MONTHS' OPERATIONS.

the first six months' operations from July 1—Dec. 31, a total mileage of 815,256 was covered in 8,282 flying 298,372 lbs. of mail and 8,000 lbs. of express were d. In the first five months 525 passengers were trans- d over various stages.

se six months' operations extended through the ex- s of the hot and cold seasons and involved flying in type of weather from sea level up to altitudes of feet.

this period there were a total of five mechanical failures. ese two were the oil pump shaft, one a cam and two age of minor parts in the valve gear. In addition to bove there were four cases of scored pistons caused by of engine temperature control, two instances occurring e very early summer and two in the first severely cold er. This trouble has now been overcome by the em- ent of cowling and shutter-control and the addition e new Pratt and Whitney hot-spot heater in the tion system.

erience has shown that the average Wasp engine in e should average 300 hours before complete over- without only routine inspection and adjustment.

has since been found that the mail loads during the first onths' operations increased to such an extent that, d with the fact that certain parts of the route over ockies entail high altitude flying, it has been found desirable to fit the Pratt and Whitney Hornet engine of 525 h.p. in place of the Wasp.

FUTURE DEVELOPMENTS.

A regular passenger service will be inaugurated during the coming summer. For this service three Boeing three-engined biplanes are under construction, each fitted with three 425 h.p. Pratt and Whitney Wasp engines.

These new aircraft will have accommodation for 12 passengers and 1,500 lb. of mail, express and baggage.

On inauguration, two machines will leave Chicago and San Francisco simultaneously once a week and these will be gradually increased to a daily schedule as the service demands.

Early in 1928 Boeing Air Transport Inc. acquired a controlling interest in Pacific Air Transport which since September, 1926, has operated a regular daily air mail service between Seattle, Wash., and Los Angeles, Calif., a distance of 1,099 miles.

The principal change following on this amalgamation will result in an increase of working capital for the Pacific Air Transport, a part of which will be spent on the purchase of four Boeing six-passenger, mail and express biplanes to be fitted with the 425 h.p. Pratt and Whitney Wasp engine.

The schedule of operations of this service will remain practically the same. The stops on this route are Seattle, Portland, Medford, San Francisco (where connection is made with the Boeing service to Chicago), Oakland, Fresno, Bakersfield and Los Angeles. This service has been illuminated for night flying by the Aeronautics Branch of the Department of Commerce.

In 1927 Pacific Air Transport covered a total distance of 693,350 miles in 7,752 hours and carried 76,237 lbs. of mail, 859 lbs. of express and 1,252 passengers.

By this amalgamation machines controlled by Boeing Air Transport now cover a total mileage of 6,096 miles every twenty-four hours, by far the most extensive commercial undertaking in the World.

NEW AMERICAN ENGINES.

According to the "Thirtieth Annual Report of the National Advisory Committee for Aeronautics" the U.S. Army Air Corps is particularly interested in the development of the Curtiss "Hex" engine, a 600 h.p. air-cooled radial with two rows of cylinders.

The adoption of the two-row arrangement is dictated by a desire to reduce the over-all diameter of radial engines and if possible to eliminate the need for a counter-balanced crankshaft.

According to the same report there are now undergoing service tests for the U.S. Army Air Corps a number of the inverted air-cooled Liberty engines developed by the Allison Engineering Co. As a result of this development the Wright Aeronautical Corporation with the encouragement of the Air Corps is developing a twelve-cylinder air-cooled Vee engine of about 600 h.p., and the Allison Engineering Co. a twenty-four cylinder "X" engine of about 1,400 h.p.

A U.S. AIRSHIP CRUISE.

At 06.15 hours on Feb. 26 the U.S. Naval airship *Los Angeles* left Lakehurst, N.J., on a cruise to Central America and back.

On Feb. 27 at 23.00 hours it moored to the mast at France Field, Canal Zone, Panama, after having covered a distance of 2,265 miles in 40 hours.

On Feb. 28 it left France Field and proceeded to Guacanayaba Bay, Cuba, where it tied up to the mooring mast of the U.S. Naval airship tender *Patoka*.

On Mar. 2 it returned to Lakehurst, to find the landing field swept by gales and snowstorms. Two mooring cables were dropped, but one of them snapped, making it necessary to cut loose the remaining one. For four hours the airship circled over the field, and then, when the wind seemed to be moderating, another attempt was made. The crew were walking the ship across the field when a sudden gust tore it away again, this time with four men hanging to the cabin.

The arrival of snow caused emergency calls to be made for an augmented landing crew from nearby naval stations, and, finally, when there was only enough fuel for two more hours' cruising, the *Los Angeles* made a third and successful attempt to land with a landing crew of 300 men.

THE LATEST PACIFIST.

According to *The Times*, the Woodrow Wilson Foundation has conferred upon Colonel Lindbergh the Peace Award, which has been previously given only to Lord Cecil and Mr. Elihu Root.

The award consists of a medal and $25,000 (£5,000). The announcement says that it is given to Colonel Lindbergh for his flight across the Atlantic and his other flights in the cause of international friendship, which have "brought a new and better spirit into the relations of the United States with its Latin-American neighbours."

THE DEVELOPMENT OF HIGH-SPEED AIRCRAFT.

On Friday, Mar. 16, Major J. S. Buchanan, O.B.E., A.F.R.Ae.S., A.M.I.E.E., will deliver a lecture before the Institution of Professional Civil Servants, at the Lecture Theatre, Royal United Services Institution, Whitehall, S.W.1, on "The Development of High-Speed Aircraft."

The lecture, preceded by tea at 5 p.m., will begin at 5.30 p.m., and Air Vice-Marshal Sir J. F. A. Higgins, K.B.E., C.B., D.S.O., A.F.C., Air Member for Supply and Research, will occupy the chair.

This lecture is open to members of the public and their friends.

A DISTINGUISHED INVALID.

A paragraph in *The Japan Times* records the fact that Lieut.-Col. Orde-Lees, formerly so well known as a gallant and persistent exponent of parachutes all over Europe, and now Professor of English at the Tokyo Higher Mercantile Marine School, was badly damaged when a motor-cycle which he was riding collided with a motor truck.

A correspondent of The Aeroplane writes that apparently the addle-headed adolescent driver of a five-ton lorry appeared to think that there was ample room for the motor-cycle to pass underneath him. One gathers that Colonel Orde-Lees has made a remarkable recovery.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: Harold E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Mar. 4.

Flying Time 17 hr. *Instruction* 10 hr. 5 min. *Soloists* 6 hr. 55 min. *Instruction.—With Mr. F. G. M. Sparks*—Mrs. Fraser, Miss O'Brien, Dr. Cook, Messrs. W. H. Lane, C. Peckham, J. A. Crane, G. Black, J. Bickley, A. J. Mulder. *With Mr. S. L. F. St. Barbe*—Mrs. Cook, Miss H. Cholmondeley, The Lord Malcolm Douglas Hamilton, Messrs. P. W. Hoare, H. Sutton, L. Rowson. *Soloists.*—Miss O'Brien, Messrs. A. J. Mulder, C. E. Murrell, W. Hay, H. M. Samuelson, B. B. Tucker, D. H. P. Esler, A. F. Wallace, R. Sanders Clark, W. B. Michelmore, G. W. Hall, P. W. Hoare, A. R. Ogston, The Lord Malcolm Douglas Hamilton, Major Beaumont. *Passengers Flights.—With Mr. Will Hay*—Master Cook. *With Mr. Sparks*—Messrs. L. F. Brown and P. C. Ward.

On Mar. 4, W. B. Michelmore and G. W. Hall passed the tests for their Aviator's Certificate. In spite of the general improvement in the weather conditions during the week, Stag Lane was very unlucky as regards fog and mist, and flying was only possible on 3 days during the week.

Flying Return for the Month of February.

Total Flying Time 71 hr. *Dual Instruction* 68 flights, 31 hr. 30 min. *Soloists* 59 flights, 28 hr. 15 min. *Passenger Flights,* 27 flights, 10 hr. 50 min. *Test Flights* 38 flights, 6 hr. 25 min.

During the month of February the rain and fog prevented any flying on 16 days.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Mar. 4.

Flying Time 31 hr. 5 min. *Instruction—With Mr. Parkinson* 7 hr. 30 min. *Soloists* 2 hr. 55 min. *"A" Pilots* 16 hr. 35 min. *Joy-rides* 2 hr. 55 min. *Tests* 1 hr. 10 min. The following members flew under instruction:—Miss Klyver, Miss Rambaut, Messrs. Mechan, Percy, V. Heaton, Lloyd-Brown, Griffiths, De Pledge, Glenny. *Soloists.*—Messrs. Mechan, Percy, Dr. Alderson. *"A" Pilots.*—Mrs. Heslop, Messrs. Stawart, Wilson, Robertson, J. D. Irving, Turnbull, R. N. Thompson, C. Thompson, H. Ellis, Dr. Dixon, Messrs. Heppell, A. Bell. *Passengers.—With Mrs. Heslop*—Mrs. Anderson, Mr. C. Thompson. *With Dr. Dixon*—Miss Stawart, Mr. Temple. *With Mr. H. Ellis*—Mr. R. G. Lawson. *With Mr. Turnbull*—Mr. Stringer. *With Mr. C. Thompson*—Mrs. Heslop, Mr. Luckman. *With Mr. R. N. Thompson*—Mr. Turnbull. *With Mr. Heppell*—Mr. R. N. Thompson. *With Mr. A. Bell*—Miss Bulmer, Mr. H. C. Walker. *With Mr. J. D. Parkinson*—Rev. Hurst, Messrs. W. Ramsay, Oakes, Bulmer, Miss Lawson.

Fog has again been general throughout the week, varying only in intensity. Flying was seldom possible during the morning and usually lasted only for two or three hours during the early afternoon. Each day there has been a good turn up of members who have patiently waited for improvement and occasionally they have been able to fly. Eleven hours thirty minutes was put in on Sunday, though flying only commenced at 11.50 a.m., after which the three Moths were fully occupied.

G-EDCA, flown by Major Mealing with Mr. Burkett, arrived at the Club on Monday. These gentlemen each carried out inspections on Tuesday and flew to Sherburn on Wednesday morning. The visibility was very bad and the machine was lost to view shortly after leaving the ground. Mr. W. Ramsay, of the A.I.D., also made inspections of machines on Tuesday, so everyone was on the *qui vive* on that day. However, we do not appear to have done anything very wicked, so all ended well.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Mar. 3.

Flying Time 4 hr. 25 min. *Instruction* 2 hr. 30 min. *Soloists* 1 hr. 55 min. *Instruction.—With Mr. Beck*—Messrs. Ambler, A. Crowther, Ellison, Ostler, Shires, Wilson. *Soloists.*—Messrs. Ellison, Norway, I. Thomson. *Passengers.—With Mr. Thomson*—Mr. Humpheries. *With Mr. Lister*—Mr. Brooks.

This week the aerodrome has again been shrouded in fog. Flying was possible last Sunday, but even then it was not wise to go very far from the aerodrome. On Tuesday, Wednesday, Thursday and Friday, flying was practically impossible, but on Saturday advantage was taken of the fine weather and a few hours put in.

We had a visit from Major Mealing and Mr. Burkett from the Air Ministry in the Director of Civil Aviation's new Moth. They o intended to stay one night for the Dance on Wednesday, but owi to the fog did not get away until Saturday.

The first Club Dance in aid of the Club-house fund was held Tadcaster on Wednesday and was a marked success. There were o 250 present and the majority of these were accommodated at tab round the dance floor.

Although the balance-sheet for the Dance is not yet complete, is expected that a substantial sum of money will have been raised

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending Mar. 3.

Flying Time 20 hr. 44 min. *Instruction.—With Flt. Lt. R D.F.C.*—Messrs. A. R. Gibbon, S. G. Hall, G. Robson, E. P. La J. R. H. Baker, G. Aldridge, E. D. Wynn. *Advanced Dual.*—Mess Messrs. W. Swann, S. H. Smith, B. W. Barton, G. Brinton. *Soloist* Messrs. R. L. Brinton, J. Rowley, E. R. King, G. Robson, S. H. Smi W. Swann, R. D. Bednell, E. J. Brighton, G. Brinton, C. W. Fellow *Passengers.—With Mr. Jackson*—Messrs. L. V. Mann, E. Skuce. *W Mr. Glover.*—Mr. J. R. H. Baker. *With Mr. Brighton*—Mr. J. H. Mo *With Mr. Perry*—Mr. G. Brinton. *With Mr. Willis*—Mr. S. H. Sm *With Mr. Barton*—Mr. E. J. Radway, Miss M. Marston.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Mar. 4.

Flying Time 33 hr. 55 min. *Soloists* 17 hr. 55 min. *Dual* 8 hr. min. *Passenger Flights* 6 hr. 15 min. *Tests* 1 hr. 25 min. *Ins tion.—With Flt. Lt. Swoffer*—Miss Grace, Mrs. Ranald, Mrs. Cr Messrs. Powell, Perfect, Curtis-Nuthall, Heath, Richardson, Sou cliffe Kerry, Whittle, Kirby, Bull, Courtney, Putteck, Mandev Scott-Hall, The Hon. H. Grosvenor. *Soloists.*—Mrs. Ranald, Mes Cripps, Fry, Kirby, Perfect, Cierva, Ranald, Heath, Shepherd, Sout Parker, Fagan, Bowen, Leach, The Hon. H. Grosvenor. *Pessenge With Flt. Lt. Swoffer*—Messrs. Graham-Gibbs, Collier, Sanders, Elc Black, Westlake, Capt. Lovett. *With Mr. Kirby*—Mrs. Swoffer, Holmes. *With Mr. Fagan*—Mr. Curtis-Nuthall, Cdr. Grier, Miss Mal

Fine weather has enabled us to put in another good flying we Arrangements for our Pageant on Whit Monday are going forward we anticipate putting up a really fine show.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwich.]

Report for week ending Mar. 4.

Flying Time 20 hr. 2 min. *Instruction.—With Mr. Lines*—Mes C. Cullum, R. Potter, H. Mack, G. Surtees, A. Cooper. *With Mr. Fr* Messrs. G. W. Barker, H. Mack, G. Surtees, R. Potter, A. J. Finch. *Soloists.*—Messrs. H. Pank, F. Gough, R. T. Harmer, W. Cubitt, W. A. Ramsay, N. Brett, G. Surtees, R. F. Potter, H. Ma *Passengers.*—Mrs. Cubitt, Messrs. A. Adcock, A. Bagshaw, S. Touls P. Pickthorne.

Our new Pilot Instructor, Mr. F. Fry, took over duties on Satur and put in some sterling work. He is a splendid instructor and spires great confidence in his pupils, and even at this early st he passed out one as soloist on Saturday and two on Sunday. Th are Mr. H. Mack, of Drayton, Mr. G. Surtees, of Lowestoft, and R. F. Potter. All these members have been training for some ti under the difficulty of not being able to devote the time to it. Th have only been able to put in about an hour a week, and someti less, therefore it is most pleasing to see them go out in such f style, all of them now being such confident, capable soloists. expect to see one or two more going off in the very near future

Mr. Lines has now completely severed his connection with the Cl

A. V. Roe and Co. Ltd. have been good enough to send us one their Avian machines down this week for a trial, and many act members have been given trial flights in it by their pilot, Mr. Bro

The other day a large bunch of keys were picked up on the ae drome. They turned out to belong to one of our flying memb although why he put them overboard we do not know. It is mos airship people who unship ballast. We welcome our new Grou Engineer, Mr. A. Kirkby, and are confident that the very best serv will be given to members in future to avoid any waste of time. far as practicable flying will be run with clockwork precision.

Mr. Browne, who has been good enough to put in a lot of time Ground Engineer, deserves the thanks of the Club for the splendid w he has carried out those duties while we were fixing up for permanent man.

Our intrepid soloist, Mr. Cubitt, is in receipt of ground instructi He tried to obtain that kettledrum effect by running the wings the Moth along a wooden fence. Of course it did not sound very ni and we suggest that the next time he wishes for some music he sho run along with a piece of stick. However, Mr. Browne is going to ta him in hand and explain what happens when wings come in cont with wooden fences.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Mar. 4.

Flying Time 13 hr. 45 min. *Instruction.—With Mr. Lowdell*—M Sylvia Edwards, Miss Rhodes, Dr. Dunn, Messrs. K. Peck, F. Jol N. W. Creasy, F. Verney, C. Hanson, H. Billington, R. Brown. *P sengers.—With. Mr. Lowdell*—Miss Gayford, Col. Rutledge, Miss Rutledge, Miss E. Rutledge, Dr. Metcalfe, Miss Hendry, Mr. Nor *With Mr. Prentice*—Miss Wilson, Miss Cox, Miss Henry, Messrs. Dys F. Rhodes. *Soloists.*—Miss Sylvia Edwards, Dr. Jas. Sleigh, Mess S. Scholfield, K. Peck, R. Brown, F. Jolly, H. Billinton, N. Crea C. N. Prentice.

Glorious weather has favoured us throughout the week and our c and only machine has been kept extremely busy.

Within nine days five of our members have been launched solo. Sunday Miss Sylvia Edwards made her first solo flight. She put an excellent performance and shows promise of being a really f pilot. We are all very proud of her. We hope to launch two oth ladies in the near future. Mr. Billinton was also launched solo a handled the machine in a remarkably fine manner. Mr. F. Jolly we off solo on Thursday and again the performance was really good

Mr. Brown, with an Avro Avian, visited us this week-end and seve

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1 FIRST SOLO FLIGHT ENGLAND TO AUSTRALIA
2 FASTEST TIME ENGLAND TO AUSTRALIA
3 LONGEST FLIGHT ever made in a LIGHT AEROPLANE
4 LONGEST SOLO FLIGHT ever made
5 FASTEST TIME ENGLAND TO INDIA
6 FIRST NON-STOP FLIGHT LONDON TO ROME

The flight is a great triumph for a British machine and pilot

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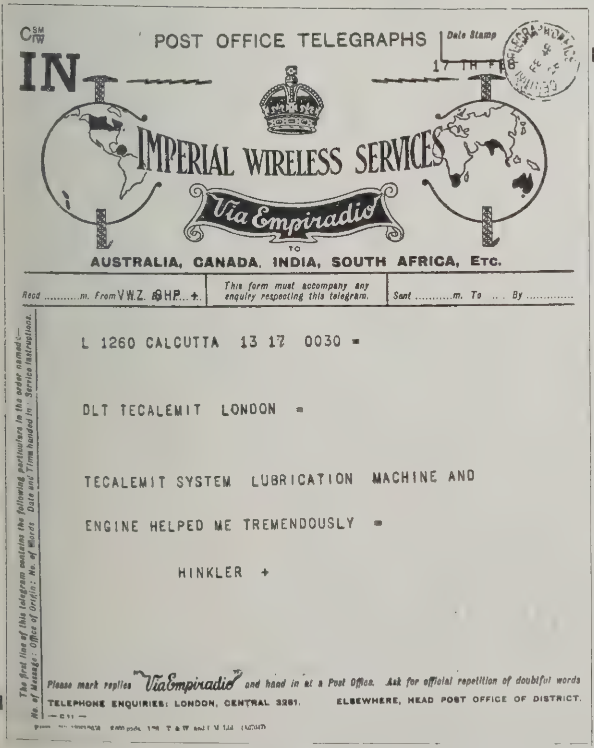

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of our members who had an opportunity of flying the machine were delighted with it and hope it has come to stay.

Altogether it has been a most enjoyable and successful week.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Mar. 3.

Flying Time 36 hr. 50 min. *Instruction* 14 hr. *Soloists* 18 hr. 35 min. *Passengers* 4 hr. 15 min. *Under Instruction.*— Major Hume, Messrs. Gibaud, Bryan, T. H. Clarke, Roberts, Girdlestone, Tanner, B. L. Bathurst, Garnett. *Soloists.*—Major Hume, Messrs. Gibaud, T. H. Clarke, Roberts, Arnold. *"A" Pilots.*—The Hon. H. C. H. Bathurst, Capt. Barnwell, Messrs. Downes-Shaw, R. A. Hall, K. E. Jopp, E. Hopper, C. T. Holmes, J. E. Tratman, T. W. Campbell. *Passengers.*—*With Mr. Bartlett*—Miss Uwins, Mrs. Wheeler-House, Mr. S. A. Tutman and *Bristol Times and Mirror* Representative. *With Mr. Holmes*—Mr. Tratman and Mr. Roberts. *With Mr. Campbell*—Mrs. Campbell. *With Capt. Barnwell*—Master F. Barnwell and Master J. Barnwell. *With Mr. Hopper*—Mr. Kilsby. *With Mr. Hall*—Capt. J. H. P. Braine.

Mr. Downes-Shaw and Mr. Jopp did more cross-country flying over Somerset, visiting Yeovil on their journey.

Morning mist on most days of the week and rain all Friday prevented us from doing still better than we did. But otherwise we had nothing to complain of in the way of weather.

The Scottish Flying Club.

[Hon. Sec.: H. W. Smith, 101, St. Vincent Street, Glasgow, C.2.]

Report for month ending Feb. 29.

Flying Time 78 hr. *Total number of Flights* 213. *Number of members under instruction* 63. *Number of days when flying was possible* 15.

Notes.—The month of February proved kinder as regards weather than the previous month, although only to a very slight extent.

On Feb. 10 the second Club Dance was held at the Waldorf, and Lady Weir of Eastwood, the wife of our President, very kindly acted as hostess. Several well-known families of the West of Scotland brought large parties, and the total number of tickets sold for the Dance amounted to 512.

On Feb. 14 we took delivery of our second Moth, G-EBVT, which was flown up from Stag Lane by one of our pilot members, Flt. Lt. T. Jones, with Mr. Barclay, another member of the Club, as passenger.

They were held up in London owing to fog, but once they started they did the journey in two laps, flying first of all from Stag Lane to Newcastle and the following day from Newcastle to Renfrew, their total flying time being 6½ hours.

G-EBVV, having already flown 125 hours, has undergone a top overhaul, and this was done very expeditiously in 4 days by the ground engineer, Mr. Calder, and his staff.

The Cinque Ports Flying Club.

The Cinque Ports Flying Club are concluding arrangements for an Aviation Week at Folkestone at Easter. There will be an Aero Show in the Drill Hall in Shellon Street, off Guildhall Street, which will open on Mar. 28 and close on Apr. 4. The Show will be open daily (except Sunday) from 2 p.m. to 9 p.m. It is expected that four different types of Light Aeroplane suitable for private and club use will be exhibited, as well as numerous accessories.

The exhibition will be followed by a Public Meeting in the Drill Hall at 8.30 p.m., at which it is hoped that Air Vice-Marshal Sir Sefton Brancker, Director-General of Civil Aviation, will speak. Sir Montagu de P. Webb, C.I.E., C.B.E., President of the Air League of India and Vice-President of the Cinque Ports Flying Club, and Sq. Ldr. W. H. Park, M.C., D.F.C., O.C. No. 25 (Fighter) Squadron, R.A.F., Hawkinge, will also speak.

Following the Aero Show a flying meeting will be held at Lympne on Good Friday from 14.0 hrs. and Easter Saturday from 10.00 hrs. Flying will continue on both days until dark.

All machines exhibited at the Show will be available for passenger carrying and in all it is expected that over twenty machines will be on the aerodrome and in addition to joy-riding there will be exhibitions of aerobatics, etc.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending Mar. 5.

Flying Time 8 hr. 25 min. *Dual Instruction* 5 hr. 15 min. *Soloists* 3 hr. 10 min.

The second Club cinema show was held on Sunday and was thoroughly enjoyed by a packed house. The programme included an advertising film which the Southern Aero Club machines undertook for a local theatre. The cast was formed of members.

The Edinburgh Aero Club.

[Hon. Sec.: T. J. Connolly, 20, Leith Walk, Leith.]

On Mar. 3 an Edinburgh Aero Club was formed at a meeting held at the City Chambers, which was presided over by the Lord Provost, Sir Alexander Stevenson. The following office-bearers were elected: Hon. presidents, Lord Provost Sir Alexander Stevenson and Lord Anderson; hon. vice-president, Major M'Kelvie; president, Major H. Ewen; hon. secretary, Mr. Thos. J. Connolly.

The Club hopes that eventually it will have an aerodrome and clubhouse of its own, but in the meantime it will take advantage of the Government's offer of facilities at Turnhouse.

The Air Ministry has also offered to subsidise the Club to the extent of a £50 grant for every pilot member who qualifies for an "A" licence.

The first machine will be a dual control Avro reconditioned by the Gnat Aero Company, of Shoreham, Sussex.

The following provisional charges have been drawn up:—Dual control instruction, 40s. an hour; solo flying, 30s. an hour; qualified pilots with observer members, 35s. an hour, and qualified pilots with associate members, 40s. hour.

THE FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending Mar. 4.

Flying Time 18 hr. *Instruction—Dual,* 3 hr. 40 min.; *Solo,* 4 hr. 50 min. *Other Flying* 9 hr. 30 min.

The week's flying is again interrupted by mist which accounts for the relatively small amount of school work done.

Seven new Moths in all, including 4 for the Royal Air Force, tested during the week and also the Moth G-EDCA destined for Director of Civil Aviation, which was duly handed over.

During the week two of the officers of the Belgian Air Force Moths to their great satisfaction.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending Mar. 1.

Flying Time 20 hr. 30 min. *Dual Instruction* 16 hr. 15 min. *Sol* 3 hr. 40 min. *Dual.—With Mr. H. D. Davis*—Messrs. Lattey, Mc Liniker, Hamilton, Dr. Forcythe, Dr. Wall and Van Gessel. *Soloi* Messrs. Liniker, Lattey, Crabtree, Dr. Wall, Mr. Cooper and Flg. Vaughan

Mr. Liniker has now passed all his tests for his Aero Club Lic

Mr. Anderson was launched solo and executed several fine figu eights in his first trip.

Mr. Crabtree led a formation flight of three machines and pu a very excellent show.

The new machine is now in service and should expedite the del of pilots.

SECRET HISTORY OF THE WEEK.

A gentleman of the name of Riker, whose claim to fam said to be the founding of Holy City, Cal., is financin flight from Holy City to Rome, the Eternal City, for a Rosencrantz, of San Diego.

A Ryan monoplane has been purchased and it will christened "The Pride of Holy City Love," with appropr ceremony at Holy City, in the Santa Cruz Mountains.

The above-mentioned Mrs. Rosencrantz will undergo in sive training to develop her flying knowledge and be she is due to leave for Rome in April she will attemp smash the World's Duration Record of 52 hours.

Who will accompany Mrs. Rosencrantz has yet to be nounced.

How shameless are these people.

According to an American source of information the Bri Government has filmed the dragon-fly and the humming- with a view to applying their hovering secrets to helico designs. These pictures were taken with an ultra-r camera and will be analysed by means of a slow-motion jector.

Another unreliable source announces that the Society the Protection of Wild Birds is carrying out similar researc with the Handley Page Slot with a view to applying its stalling secrets to inebriated hoopoes.—L. B.

A BOOK TO BUY AND KEEP.

LETTERS FROM A FLYING OFFICER.

BY

ROTHSAY STUART WORTLEY.

Letters from a Flying Officer should be read by all old R.F.C. pilots, because they will enjoy a reminiscence which is without distortion. It should be read by the rising generation of pilots, because it will teach them much that they ought to know, and it should be read by the general public, because it records, not the alcoholic and other excesses of certain "Stepsons" of the R.F.C., but the real work of a Fighting Service by a modest, thoughtful, and gallant son of the Service.

The Aeroplane, Feb. 22, 1928.

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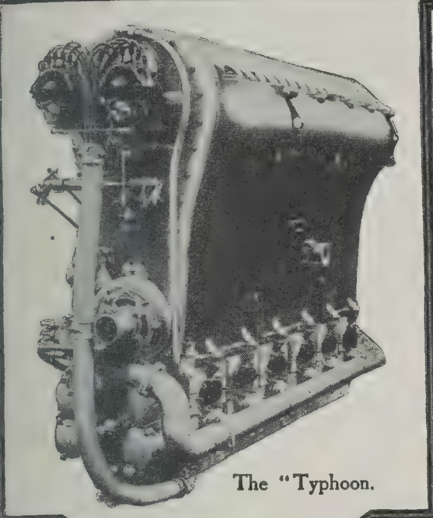

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15-45

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 19; Tuesday, 16; Wednesday, 16; Thursday, 16; Friday, 17; Saturday, 19; Sunday, 8.

IMPERIAL AIRWAYS LTD. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne : Machines 38, passengers 243, freight 14 tons.
AIR UNION :
Paris—London : Machines 32, passengers 106, freight 14½ tons.
K.L.M. :
Amsterdam—Rotterdam—London : Machines 16, passengers 74, freight 4 tons.
SABENA :
Brussels—London : Machines 12, passengers 12, freight 1 ton.
DEUTSCHE LUFTHANSA AG. :
Amsterdam—London : Machines 12, passengers 47.
PRIVATE :
Machines 0, passengers 0.
Total number of trips by British Machines, 38, carrying 243 passengers. Foreign Machines, 73, carrying 239 passengers.

COMPARATIVE FIGURES.

Week ending Mar. 4 :
Machines, 111; Passengers, 482; Crews, 220; Total personnel, 702.
Corresponding week, 1927 :
Machines, 77; Passengers, 227; Crews, 123; Total personnel, 350.
Corresponding week, 1926 :
Machines, 76; Passengers, 198; Crews, 93; Total personnel, 291
Corresponding week, 1925 :
Machines, 69; Passengers, 137; Crews, 81; Total personnel, 218.
Corresponding week, 1924 :
Machines, 88; Passengers, 123; Crews, 140; Total personnel, 263.
Corresponding week, 1923 :
Machines, 61; Passengers, 197; Crews, 116; Total personnel, 312.
Corresponding week, 1922 :
Machines, 44; Passengers, 110; Crews, 74; Total personnel, 184.
Corresponding week, 1921 :
Machines, 31; Passengers, 69; Crews, 35; Total personnel, 104

Croydon Notes.

The continued fine weather during last week has still further increased the air line traffic. Reference to the statistics published on this page will show that the traffic in the last week was more than double that of the corresponding week in any previous year. One very interesting feature of this rise in traffic is the large increase in the Luft Hansa passenger figures, which have been very small during the past few months.

K.L.M. have now two of the new Fokker F.VIII machines, the second of them, H-NAEE, having made her first trip to Croydon during this week. These machines are certainly very excellent examples of commercial aircraft. They are simple in construction, pleasing to the eye, certainly quite fast, and are reported to be very comfortable.

As they have a paying load capacity of 3,000 lbs., and seating accommodation for 15 passengers, they are the equals of all Imperial Airways "giant air liners," except the Argosies, in this respect.

Judging from the recent traffic returns of the K.L.M., the use of these machines on the London-Amsterdam route will be freely justified in the next few months.

Mr. G. I. Thomson, until recently instructor to the Hampshire Aeroplane Club, has just joined the staff of Imperial Airways as a pilot. Further additions to this staff may be expected in the near future, particularly if traffic continues to increase at the present rate.

The London to Cannes air service, which was inaugurated by Air Union on Mar. 1, met with an unfortunate mishap on the first day. A strong headwind delayed the machine from Croydon to Paris so much that the machine from Paris onwards had left before it arrived. The party of three English passengers were therefore sent on in a "special" Spad, which was forced by engine trouble to land in a field 5 kilometres from Lyons. The machine overturned, fortunately without serious injuries to any of the occupants.

A MALAYAN AIR LINE PROJECT.

According to reports in *The Times,* Sir Hugh Clifford, Governor of the Straits Settlements and High Commissioner for the Federated Malay States, has expressed strong approval of the scheme for operating an air line from Penang to Singapore, and, in co-operation with the Dutch service shortly to be started, to extend it to Batavia.

The scheme in question is that due to the Air Survey C Ltd., who propose to form a new company, to be known a Eastern Airways Ltd., to operate a daily seaplane servic between Penang, Port Swettenham and Singapore, with weekly extension to Batavia. There will probably also be weekly Dutch service over the latter section of the route.

This extension will link up with the K.L.M. air mail se vice in the Dutch East Indies which will be operating withi the next few months, and will establish rapid communication between a number of very important commercial centres whic now have but poor and infrequent steam-boat services.

The Air Survey Co.'s scheme has the technical approval the Air Ministry, and it is said that the Colonial Office ha now given its sanction to the voting of subsidies by the loca Administrations concerned.

It is intended that large three-engined flying-boats sha be used on this service.

A FRANCE—SOUTH AMERICA AIR MAIL SERVICE

On Mar. 1 the composite air and steamship mail servic from France to South America began operations when a co signment of mail left Paris in the evening by train for To louse.

On Mar. 2 an aeroplane of the Lignes Aériennes Latécoè left Toulouse with the mail *en route* for Saint Louis, Senega It reached Casablanca and Agadir safely but since leavin the latter place for St. Louis it has not been heard of. Tw relief machines have been despatched from Casablanca search for the missing machine, which is believed to hav been forced to land in an isolated spot on the West Coa of Africa.

For the present the mails from Paris will go as far as To louse by train. At Toulouse they will be handed over to th Latécoère company which will carry them in stage to Saint-Louis, Senegal. The machines used on th section will be Breguet or Latécoère land machine and C.A.M.S. flying-boats. From Saint Louis to th Cape Verde Islands the mails will be carried in Lat coère flying-boats, and there they will be transferred to fa steamers which will take them to Fernando Noronha. Fro this island Latécoère land machines will fly to Buen Aires. There will be one service a week in each directio and the time for the whole journey from Toulouse to Buen Aires is scheduled at 7½ days. When night flying becom possible and the whole route can be covered by air it hoped to reduce this time to 4½ days.

A BULKY PRESENT.

On Feb. 23 the King and Queen of Afghanistan visited th Berlin Airport, the Tempelhofer-Feld. In the course of speech of welcome it was announced that the Deutsche Lu hansa hoped in years to come to extend its Berlin—Mosco air route to Afghanistan.

After inspecting the aerodrome and watching a flying di play, the Royal guests were presented by the German Gover ment with a three-engined Junkers passenger monoplane.

ENCOURAGING PROGRESS IN SWEDEN.

According to *The Times* the Svenska Luftfartförbund (Swedish Air Traffic Association) has applied to the Gover ment for a grant of 300,000 kr. (£16,500) to enable it to car out its programme for accelerating the development of a traffic.

The Svenska Luftfartförbundet is apparently a body who object is the stirring of interest in the direct encourageme of civil aerial activity in Sweden. Its methods seem to more severely practical than those adopted by some oth bodies with similar aims in other countries. It is said th the new Civil Flying School at Stockholm, opened on Feb. owes its existence to the Association, and that it hopes the future to arrange for experiments in night and fog flyin the lighting of landing places, and the erection of expe mental aerial light-houses.

Further it hopes to be able to purchase aeroplanes to used as ambulances in certain districts in Sweden.

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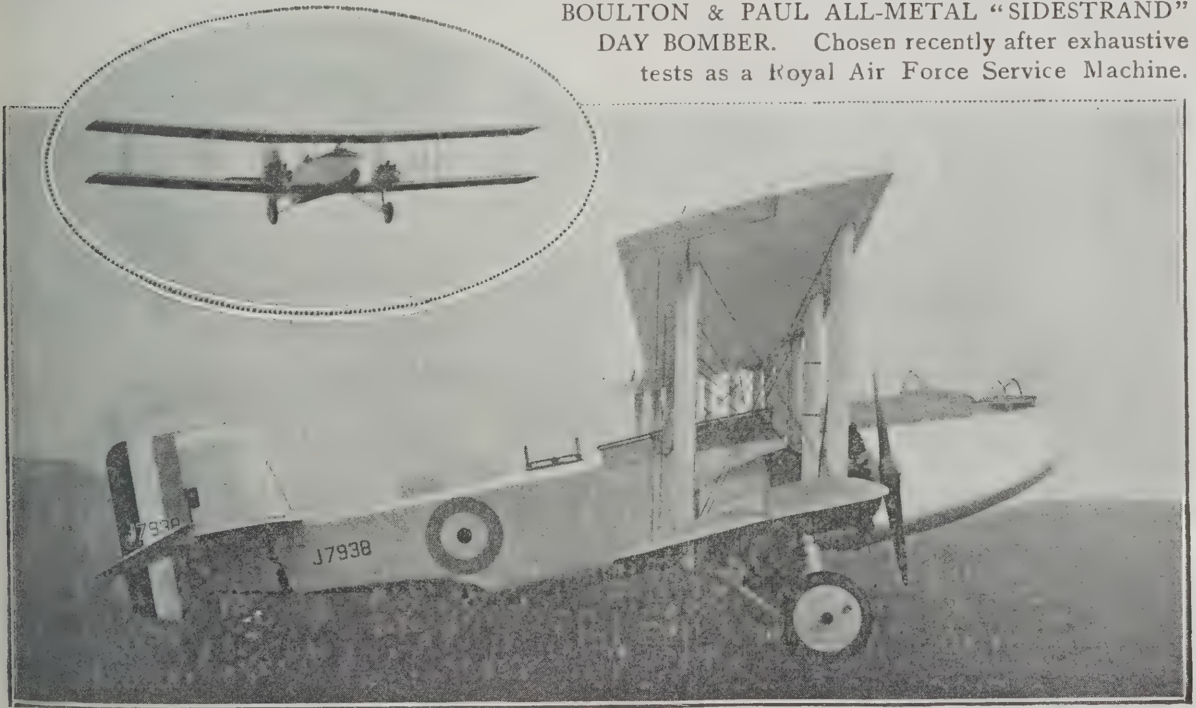

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A NORTHERN ADVENTURE.

On Feb. 17 a Fokker Universal (Wright Whirlwind engine) belonging to the Hudson Bay Expedition, while engaged on a patrol from Port Burwell, was forced to land on an Atlantic icefloe, 60 miles from the Ungava coast of Labrador.

The crew, consisting of Flg. Off. Lewis, F-S. Terry, and an Eskimo guide, abandoned the aeroplane, which had a broken airscrew and damaged skis, and started off in an easterly direction, and travelled for one day in heavy weather with low visibility. The weather cleared next day, and enabled their position to be fixed, and showed that they were heading for the open sea. Retracing their course, they journeyed steadily over the ice floes for seven days, until they reached the Labrador coast, near Kamaktorvik, where they met an Eskimo hunter, who, after a further four days' travelling, brought them safely to their base at Port Burwell on March 1.

During their journey over the ice the crew first used an air raft in making from floe to floe, but the Eskimo inadvertently lost it. The paddles, however, were saved, and small ice pans were used as rafts to cross open water. Part of the emergency ration was likewise lost, and part discarded to lighten the burden of the men. In the later stages of their journey they lived on raw walrus food, shot by the Eskimo with an emergency kit rifle.

SIR ALAN COBHAM'S PROGRESS.

On Feb. 29 Sir Alan Cobham and party who are making a survey flight round Africa on the Short Singapore (two 650 h.p. Rolls-Royce Condor engines) arrived at Mpulunga on the south end of Lake Tanganyika.

On Mar. 1 they flew from Mpulunga to Vua at the north end of Lake Nyasa.

On Mar. 2 they proceeded to Fort Johnston at the south end of Lake Nyasa and on the following day flew from Fort Johnston to Biera, Portuguese East Africa.

THE CANADIAN AVIATION LEAGUE.

On Jan. 23 and 24 the first annual meeting of the Canadian Aviation League was held in Ottawa under the patronage of Lord Willingdon, the Governor-General. Major-General J. H. MacBrien was elected president and Colonel R. H. Mulock vice-president. Fifty delegates from all parts of Canada were present. It was resolved to name the organisation the Canadian Aviation League and to apply for affiliation to the Air League of the British Empire.

Twenty branches have so far been organised. These are in Charlottetown, Halifax, St. John, Quebec, Montreal, Ottawa, Peterboro, Oshawa, Toronto, Hamilton, London, St. Catherines, Windsor, Guelph, Galt, Winnepeg, Regina, Saskatoon, Edmonton, Calgary, Vancouver, and Victoria.

Many prominent Canadians are identifying themselves with the movement including Mr. Taschereau, Premier of Quebec; Mr. Perodeau, Lieut.-Governor of Quebec, Mr. G. W. Beatty, President of the Canadian Pacific Railway, Sir Arthur Currie and the Hon. Walter Nichol.

AN OPENING FOR BUSINESS.

There seems to be an opening in London for a kind of general aviation business something like the old Aircraft Supply Company which was run by Mr. Bernard Isaac in the very early days of aviation, somewhere about 1909, with, of course, adjustment to modern conditions.

The idea is suggested by a letter from Mr. James B. Taylor of New York, who will be remembered by a good many people in the Air Force as having served with the British Flying Services during the War. Mr. Taylor is associated with other well-known business people in an enterprise called Air Associates, Inc., which has taken unto itself a ground fl shop, complete with large window, on Fifth Avenue a 44th Street, which is about equivalent to a shop in Bo Street or Piccadilly.

Air Associates Inc. is apparently ready to do bu ness in anything concerned with aviation. They prepared to undertake anything between wind tunnel te and the sale of a pair of goggles. They have the servi of competent aeronautical engineers who will either adv on designs or undertake designs of aeroplanes or engin They will book passages between San Francisco and N York, or between London and Moscow. They will underta air advertising or air photography. They enrol pupils flying schools or ground engineers' courses. They sell ae nautical books and magazines. They do aviation insura for pilots, owners, passengers or instructors. They sup information for trade directories, files, catalogues, or ne

In fact they do anything and everything for anybody a everybody who wants anything done in connection w flying. One gathers that the firm is already doing qu good business and with the growing interest in flying in States the firm ought to be very valuable in helping the mindedness of the Nation.

PARIS—THE CAPE.

On Mar. 2 MM. Mauler, Baud and Cohendy left Le Bour on a Caudron C-129 biplane (120 h.p. Salmson engine) in attempt to fly to the Cape in 14 stages by way of Alican Dakar, Boma and Elizabethville.

The flight is sponsored by the Paramount Film Compa in collaboration with *Le Petit Parisien*, and a film record the journey will be taken by M. Cohendy, a cinema operato

NEW COMPANY.

Scottish Flying Club Ltd.—Registered in Edinburgh, Feb. 23, a company limited by guarantee, without share capital. Objects: carry on business indicated by the title. The directors are:—G. Walker, Foxley House, Mt. Vernon, Glasgow, chemical manufactu H. W. Smith, 3, Burnbank Gardens, Glasgow, yarn merchant; A. Dunlop, 27, Newark Drive, Glasgow, insurance broker; A. N. Kingw 191, Sandy Road, Renfrew, aircraft pilot; B. R. Millar, 4, Dundor Road, Glasgow, engineer; K. McIntosh, Drumadoon, Tinto Ro Glasgow, solicitor; Lord Weir, Eastwood, Renfrewshire, engine J. G. Weir, Sheldon, Dalrymple, Ayrshire, engineer; H. E. Yarr Craigend Castle, Milngavie, shipbuilder; G. F. Luke, Lochiel, Bears Glasgow, director of Linen Thread Co. Ltd.; J. D. Cormack, 11, P Terrace, Glasgow, C.3, professor of engineering; and H. L. Mur Phillipson, Stobo Castle, Stobo, Peebleshire, director of North-East Marine Engineering Co. Ltd. Secretary: Harry W. Smith. Registe office: 101, St. Vincent Street, Glasgow, C.2.

PERSONAL NOTICES.

Death.

FODEN.—On Feb. 27, at Hill House, Christchurch Road, Winches Elizabeth, infant daughter of Flt. Lt. and Mrs. J. C. Foden, a two months.

Forthcoming Marriages.

KNOLLYS—COATS.—The engagement is announced of Visco Knollys, D.F.C., and Margaret, daughter of Sir Stuart and Lady Co of Ballathie, Perthshire.

SOUTHEY—DAVIES.—The engagement is announced of Flg. Harold F. G. Southey, R.A.F., only son of the late Canon Sout and Mrs. Southey, of St. Christopher's, Clevedon, Somerset, and M Joan M. G. Davies, elder daughter of Mr. and Mrs. Harold B. Dav of 27, Park Mansions, Knightsbridge.

SUTTON—DE LA RUE.—A marriage has been arranged, and take place very quietly, between Wing Cdr. B. E. Sutton, D.S O.B.E., M.C., only son of the Rev. Canon Sutton, C.B.E., Bridek Vicarage, Cumberland, and Margaret Griselda, only daughter Alexander Wedderburn, K.C., C.B.E., The Hoo, Willingdon, Sussex.

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THE AEROPLANE—MARCH 14, 1928.

THE AIR ESTIMATES

THE AEROPLANE

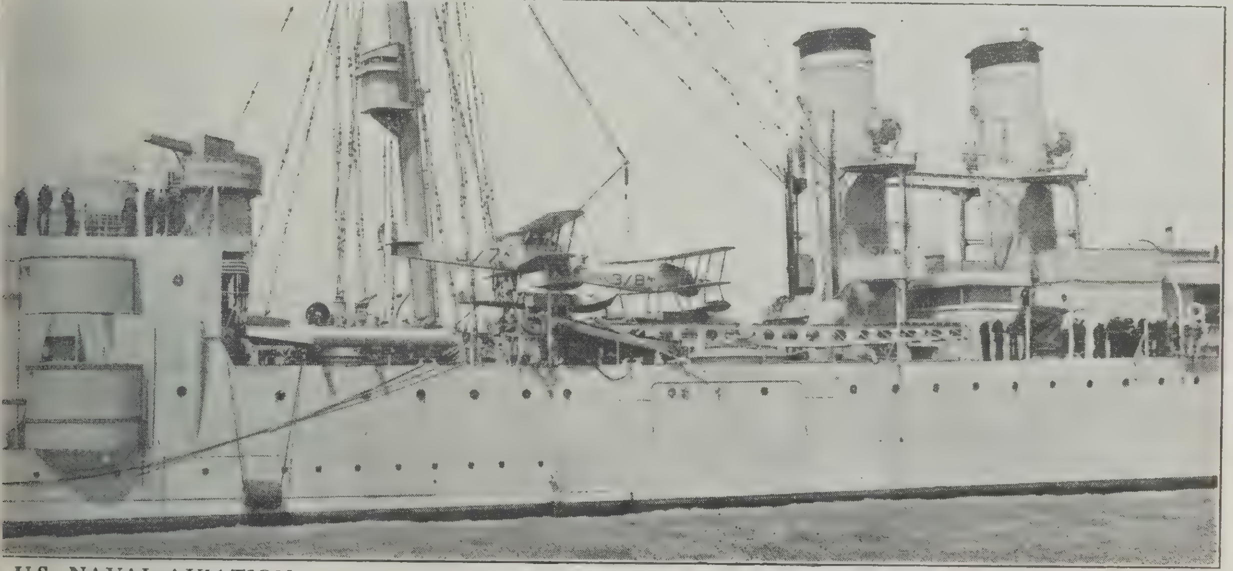
INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

UNIVERSITY OF ILLINOIS

Vol. XXXIV. No. 11. SIXPENCE WEEKLY. [*Registered at the G.P.O. as a Newspaper.*

"WINGED SENTRIES, ALL SKILLFUL IN THE WARS."—*(Vaughan.)*



U.S. NAVAL AVIATION:—The two Vought UO-1 seaplanes (Wright Whirlwind engines) and the starboard catapult of the U.S.S. "Richmond." A photograph taken at Shanghai during the recent Soviet troubles.

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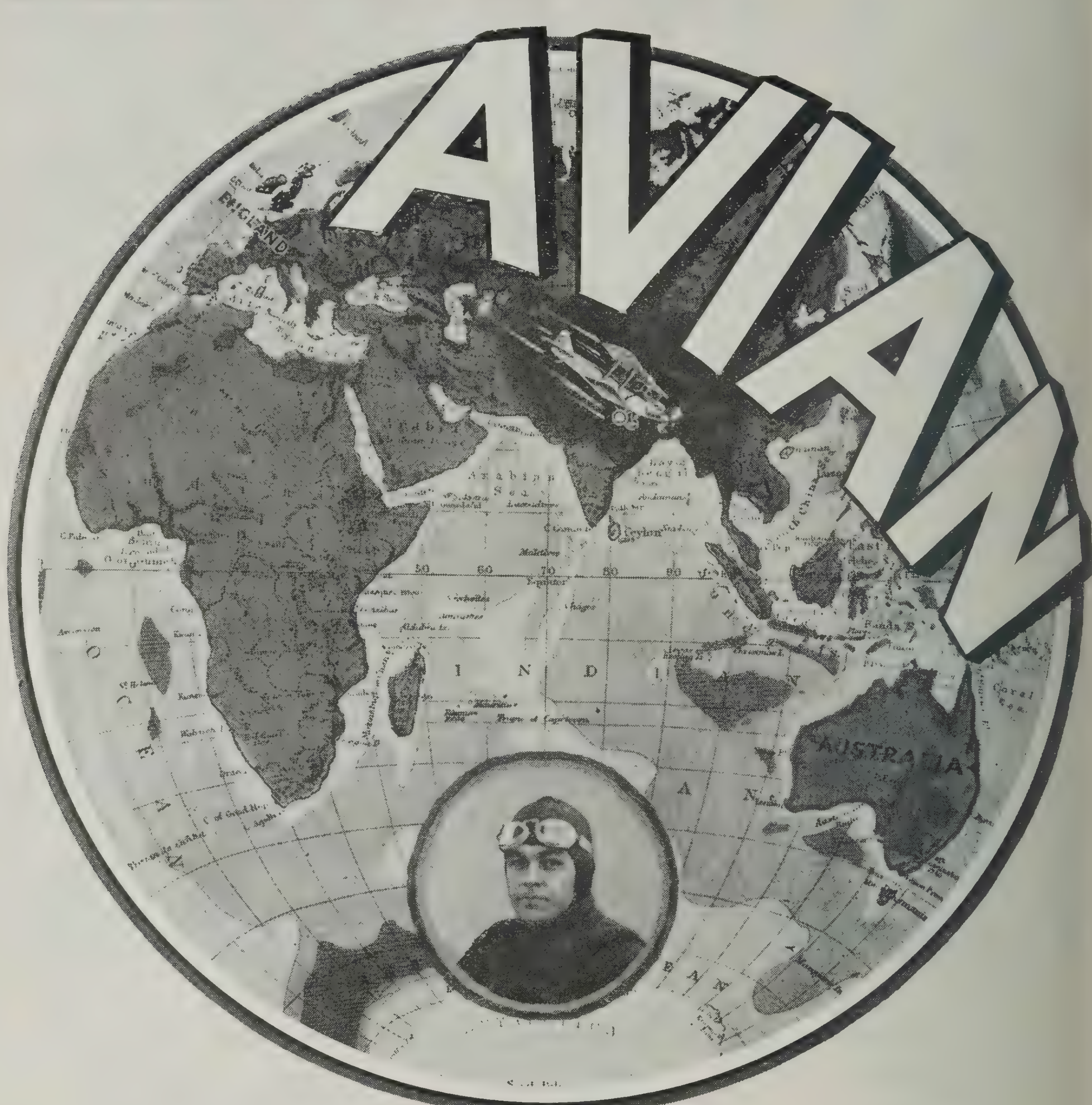

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4. LONGEST SOLO FLIGHT ever made.
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6. FIRST NON-STOP FLIGHT—LONDON TO ROME.

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MAR. 14, 1928.

THE AEROPLANE

Incorporating
Aeronautical Engineering

VOL. XXXIV.
No. 11.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON THE AIR ESTIMATES, 1928-29.

ere have been years in the past in which the voluminous ment entitled "Air Estimates" has been presented to iament long enough before the actual Debate to give ibers an opportunity of studying the document and of ning enlightenment thereon from well-informed sources at they might take an intelligent part in the Debate. year the Estimates were published on Friday, March 9, the first stage of the Debate was already booked for day, March 12. Consequently unless Members gave up week-end to the study of the figures they had not much ce of understanding them, and they had still less ce of informing themselves on points which are not in their own knowledge.

ssibly this cutting of time may be due to the simple that in all past years the House of Commons has shown ittle interest in the Air Estimates that on several ions the House has just escaped being counted out be- so few Members were present. Thus the Government have considered that it would be justified in taking the that there was no use in giving Members plenty of time hich to study a subject which obviously does not interest .

INTRODUCTORY.

e "Memorandum by the Secretary of State for Air company Air Estimates for 1928," which is the official duction to the Estimates, begins thus:—

> net total of Air Estimates which Parliament is asked to vote 250,000l., the gross total being 19,135,100l. The corresponding s for 1927 were 15,550,000l. net and 19,986,400l. gross.
>
> gross amount, therefore, shows a decrease of 851,300l., but at me time contains provision for an additional expenditure of some l. due to the further expansion of the Fleet Air Arm. The rse on services more directly within Air Ministry control is uently about 1,050,000l.
>
> to be noted that this decrease has been effected in a year in the Royal Air Force will (over and above the expansion of the e Air Arm) be enlarged by two new flights of flying-boats and formation of two new squadrons for India, besides assuming onal responsibilities at Aden. These increases of strength are d to in more detail below
>
> apparent increase of 700,000l. in the net estimates is due to the tinuance of the existing form of the Middle East Vote on the Estimates which has hitherto met all expenditure in 'Iraq, ne, Transjordan and Aden falling on gross Air Votes by a ing appropriation-in-aid; and the substitution of a subhead on lonial and Middle Eastern Services Vote out of which will be ly the extra cost of maintaining in 'Iraq, Palestine and Trans-, instead of in this country, such air forces as are still retained
>
> principle of "extra cost" is not applicable to an imperial base den, but the cost of the air command at that place will be met by the appropriation-in-aid of Air Votes of a proportion of isting Indian contribution of 250,000l., which will be shared with my.
>
> he is again a "super-cut" applied (in a proportion slightly nt from that of last year) to Votes 3 and 4.
>
> ils are shown in the following table:—

	1928.	1927.	+ or —
	£	£	£
ross (total of expenditure sub-ds)	19,635,100	20,486,400	— 851,300
ct "super-cut"	500,000	500,000	——
stimate	19,135,100	19,986,400	— 851,300
ct Appropriations-in-aid ...	2,885,100	4,436,400	—1,551,300
imate	16,250,000	15,550,000	+ 700,000
of Appropriations-in-aid:—			
Civil Votes (Middle East) ...	250,000	2,257,000	—2,007,000
... ...	150,000	110,000	+ 40,000
pies to troops (Middle East and n)	180,000	283,000	— 103,000
Air Arm	1,080,000	882,000	+ 198,000
ary Appropriations-in-aid ...	1,225,100	904,400	+ 320,700
ppropriations-in-aid	2,885,100	4,436,400	—1,551,300

> he gross decrease of 851,000l. about 500,000l. is found under (Works and Buildings). The slowing down of the expansion of the Royal Air Force and in the provision of permanent accommodation has its maximum effect on this vote in the coming year
>
> The variations on the other votes are explained below; generally speaking they are the outcome of normal developments which would have led to a total increase but for their being outweighed by continued efforts in the direction of economy, particularly in 'Iraq, where owing to continued success in the use of air power it has been possible to effect reductions amounting to about 600,000l. on Air Votes alone.

Those who can understand the juggling of figures by Treasury officials are welcome to what information they can get out of the foregoing statement. Apparently what has happened is that instead of the Middle East paying the whole cost of the R.A.F. in that Area, it only pays the difference between what the R.A.F. Units do cost in the Middle East and what they would cost if kept at home.

There may be some consolation in reading that there is a decrease of half a million pounds in Works and Buildings. But that is more than offset by the lamentable fact that it is made possible by the slowing down of the expansion of the R.A.F. and the consequent less need for permanent accommodation. When one considers how many people in the R.A.F., including all the Cranwell cadets, and the Staff College, are living in war-time huts, there seems little enough excuse for economising in this way.

EXPLANATORY.

Having heard Sir Samuel Hoare speak on numerous occasions and having read all that he has published on aeronautical affairs one has too much respect for his taste in the use of the English language to imagine that he personally is guilty of this Memorandum. And one would like to suggest that the next Air Estimates be increased by a sum of, say, five guineas, to pay for the editing of the next Memorandum of this kind so that it may be presented in comprehensible and decent English.

The late Sir Walter Raleigh, who in the first volume of *The War in the Air* has left us a legacy of almost perfect English, once wrote that "public office English is a bloody jargon." Seldom has one seen such jargon as in this Memorandum. Apart from much of it being merely incomprehensible, owing to figure-juggling, the perpetrator of it is guilty of solecisms which one would imagine to be impossible outside of daily journalism.

Twice at least he uses the word "anticipate" when he apparently means "expect,"—thus making the meaning of the document ambiguous. Later, writing of the arrival of the Far East Flight at Singapore, he says:—"*From thence* the Flight will be continued to Australia." And he always writes "commence" when he means "begin."

How many times he uses the hideous phrase "carried out" instead of the simple "made" or "done" would be waste of time to count. Of the progress of the airship at Cardington he writes:—"Much of the installation of fuel and ballast tanks, gangways and similar equipment can be carried out on the ground." In the absence of an airship to lift them, obviously, if anyone wanted to carry these things out, they *would* be carried on the ground.

One can only beg that if Sir Samuel Hoare is still Secretary of State for Air a year hence, as we all hope, he will edit his memorandum himself. The present affair is an abomination.

INCREASES OF STRENGTH.

There are in this Memorandum certain interesting points which may well be discussed before going on to the actual figures of the Estimates.

The first thing that strikes one is the apparently satisfactory statement that three squadrons, two regular and one non-regular, have been formed for Home Defence. But the fact that two of the Home Defence Squadrons have recently been ordered to India is disclosed in a different paragraph, thus disguising the fact that, until two new Squadrons have been formed, Home Defence will be that much short.

Apart from that, five new Flights, equivalent to 2½ Squadrons, have been or are being formed for the Fleet Air Arm, and one new Squadron is forming for Army Co-operation.

Thus the present strength of the R.A.F. is given as "approximately equivalent to 69 squadrons, including 8 on a non-regular basis." If one knocks off the squadrons which are still being formed, and if one allows for the lack of training and lack of strength of the Non-Regular Squadrons, probably the actual strength of the R.A.F. is about 55 squadrons.

However, the Memorandum tells us that developments in 1928 will be principally overseas and will result in a total addition of the equivalent of 4 new squadrons, so that the Royal Air Force will, at the end of the year, comprise 73 squadrons in all.—Amen. Let us hope.

India's Affairs.

There is some consolation in the fact that the cost of two of the new squadrons will fall on the Indian Exchequer, and that when the two squadrons which have been ordered to India arrive there will be altogether eight squadrons in India.

By a curious coincidence, on the very day when the Estimates were published, the daily papers made known a speech by Field-Marshal Sir William Birdwood, Commander-in-Chief in India, delivered on March 8 to the Legislative Assembly at Delhi, in which he announced that His Majesty's Government had agreed to open vacancies at Woolwich and at Cranwell for Indian cadets with a view to the formation of Indian Artillery, Engineer and Air Units. According to *The Times* the examination papers for these Colleges will be modified in favour of Indian candidates.

The development of an Air Force manned entirely by natives of India will be interesting. If pilots be selected from the horse-riding classes, races, nations, or tribes, they may turn out quite well. But in any case many years must pass before military training and education is able "to fit Indians to undertake the defence of India," even if the work of the warriors be not quite spoiled by the intrigues of the "politically-minded classes."

Consequently we may hope that for many years to come the wealth of India will be available to increase the size of the Royal Air Force. For this will help it to become more nearly adequate for the defence of the British Empire.

The Sea-Faring Branches.

Two new flights are also to be formed in 1928-29 for the Fleet Air Arm, thus bringing the strength of that branch up to 12½ squadrons.

Deducting these 12½ squadrons from the alleged and hoped-for 73 we find that the Royal Air Force proper, plus the Army Co-operation squadrons, will only amount to 60½ squadrons in all. Which seems inadequate for any considerable war over land if the Navy also happened to find itself at war and were unable to lend any of its Fleet Air Arm squadrons to the land forces.

A bright spot is, however, to be found in the statement that provision is made for two new flights of flying-boats, one for Home Waters and one for Overseas. As no hint is given that these are intended for the Fleet Air Arm, we may hope that the task "of protecting Imperial communications," at any rate with such craft, will be permanently allotted to the R.A.F.

Arabia and Africa.

The statement that No. 47 Squadron has been moved from Egypt to Khartum, No. 45 from Egypt to 'Iraq, and No. 8 from 'Iraq to Aden, will no doubt give pleasure to Socialist M.P.s, who will thus be able to raise an outcry against our aerial tyranny over alleged inoffensive Niggers in Central Africa, Gyppies in Egypt and Arabs in the Yemen, regardless of the depredations of Nuers, Egyptian Bolsheviks and the Zaidi Imam Yahya of Sana.

In the section devoted to long-distance flights the absence of any plan for a flight from Egypt to Nigeria this year is noticeable. Presumably the mishaps to the flight of 1927 account for this.

Some time ago an officer who had been in the flight to South Africa asked an officer who had been in the first Nigerian flight how one got to Nigeria. The answer was "Go down to Khartum. Turn to the right. And keep straight on." Apparently the journey is not quite so easy as all that.

In this section the statement is made that the Far East Flight of Southampton flying-boats will return to Singapore from Australia via Borneo, the Philippines and Hong Kong. This, one believes, is news.

Personnel and Training.

In the paragraph on Personnel a decrease of 500 in the total number of the R.A.F. is disclosed, in spite of the formation of the new squadrons. This is explained by the replacement of Service personnel by civilians at R.A.F. permanent stations, and by savings in ancillary services in 'Iraq.

So long as the civilians are made to do their work properly this is a good scheme. Every airman in the R.A.F. has to be, by nature of his duties, as physically fit as Grade A.I infantryman—for he has often to fight as infantryman besides working as a mechanic. Civilian e ployees in R.A.F. stations need not even be C.III, so lo as they know and will do their jobs.

In time of war, the civilians can always be conscript and pushed into uniform. Meantime, not being in unifor one imagines that there must be difficulty in maintaining d cipline among them.

On the subject of training, we are informed that Spitt gate, near Grantham, is to be turned into a Flying Traini School and that No. 1 F.T.S. is to be transferred there fr Netheravon. This apparently is part of the policy of c centrating training establishments in or near Lincolnshi and putting the War units in areas frequented by the Ar and Navy—which is good.

Lincolnshire and the country round is admirable for training of pilots. Also the people of Lincolnshire, havi no big Army establishments, except the depot of the Linco shire Regiment, not only accept the R.A.F. as worthy presentatives of the King's Armed Forces but have learn to call them by their proper rank-titles. In Army areas people, both county and town, still insist on translati those titles into Army ranks and in the Naval areas th translate them into Navy ranks. Lincolnshire seems to the proper home for the R.A.F. And perhaps it is not wi out reason that Cranwell has appropriated *The Lincolnsh Poacher* as its pet marching tune.

The information is also given that the School of Physi Training at Uxbridge and the School of Accounting and Sto keeping at Kidbrooke are now brought under the Vote Educational Services. But one regrets to see that in sp of these additions the Vote for Education shows a decrea

Dominion Interchange.

Under the heading "Dominion Co-operation" we are t that officers of the Royal Australian Air Force trained initia in Australia and serving with Short Service Commissions the R.A.F. have proved valuable and efficient. One can w believe it. Many of our best officers have been Australia

In the Estimates themselves the fact is disclosed that Australian Government is paid by the R.A.F. for the init training of these officers. This seems wrong. They co here only partly trained. They get all their training for at the R.A.F.'s expense. And they go back to the Ro Australian Air Force, where they cannot be used as Reser for the R.A.F. like other S.S officers. So Australia mal a big profit on them.

In this connection we are also told that a Wing Comman and three Squadron Leaders have been lent to Australia service at Headquarters. This is part of a regular scheme interchange between the R.A.F. and the Australian a Canadian Air Forces to secure as far as possible identity the objects and methods of training of the Air Forces the Empire.

The pity is that similar exchange cannot be made with South African Air Force,—which is not yet Royal, like R.A.A.F. and the R.C.A.F. The individual South Afric Dutch or British, is a charming person. But the S.A.A. seems as a whole to be under the blight of tribal (it is racial) cleavage which is the curse of South Africa, and be so till the present generation of men over 35 are dead.

Further we are told that six officers of the 'Iraq for are being trained as cadets at Cranwell for the 'Iraq Gove ment. Their progress should be interesting to watch. Ad interest may be found by the Staff at Cranwell if they discover the origin of each 'Iraqi cadet,—whether, for ample, a cadet's ancestry is Arab, Kurd, Persian, Turk, syrian, Circassian, Georgian, Syrian, Turkoman, Hazara, a mixture. Valuable information as to the fighting value the different peoples might be got from the cadets' abi as pilots.

Reserves and Auxiliaries.

The Air Ministry seems to be satisfied with the growth the Reserve and Auxiliary Forces. Certainly these units doing their best, but they will have to do a great deal m training and will have to be equipped with modern machi before they can be reckoned as efficient as were the Te torial units of the Army which went so gallantly into War in 1914.

Under this heading the statement is made that airm pilots transferring to the Reserve are to do flying pract at civil schools, just as officers of the R.A.F.O. have b doing. How does this apply to airmen pilots re-muste to their trades after five years' flying, who apparently no more flying till they leave as time-expired aircraftmen

Reference is also made to the fact that the squadrons Oxford and Cambridge are progressing satisfactorily and p vide a flow of candidates for commissions. During the p year the authorities at both Universities have been induce allow flying in Term time.

England to Singapore—
with Napier engines

FOUR Royal Air Force Supermarine "Southampton" flying boats, each fitted with two Napier Lion engines, under the command of Group Captain Cave-Brown-Cave, are engaged on a cruise to Australia and the Far East.

These aircraft have now reached Singapore.

10,625 miles have been covered—85,000 engine miles—and not the slightest trouble has been experienced.

Never before has such an ambitious cruise been attempted.

Flying together, the flying boats have kept to a pre-arranged time-table throughout.

It is significant that all the successful long-distance flights of the Royal Air Force have been carried out with Napier engines.

The "Daily News" of Feb. 27, says—
These engines, which have once again proved their unsurpassed reliability, are similar in main features of design to the racing engines which swept the British seaplanes to victory in the last international race for the Schneider Trophy.

To ensure reliability
install your aircraft
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The Technical Side.

On the subject of Technical Equipment the Memorandum discloses a decrease of £359,000. The principal cause of this, is a reduction of £200,000 in the Estimate for Aircraft Spares. This is stated to be due to satisfactory experience of the maintenance-cost of modern types.

Our Aircraft Manufacturers may take credit to themselves for this saving although it comes out of their own pockets, for the manufacture of spares is, one imagines, as profitable in proportion to the turnover as is the manufacture of complete aeroplanes. Nevertheless, one would have thought that, as less spares are wanted, the money might well have been spent on complete aircraft, which are very badly needed, seeing how many of our squadrons are still mounted on war-time machines, or on machines whose performance is really very little better than that of war-time types.

The rest of the decrease is ascribed to "the overall allowance for under-spending,"—whatever that may mean.

The Memorandum further informs us that the process of re-equipment with new aircraft and aero-engines will be continued. It might well be accelerated without any marked increase in cost. However, as there seems to be no great increase in the orders to be expected from the R.A.F., till the next war causes a panic rush, perhaps the Trade will at last see that still better business is to be had from Commercial Aviation,—if a firm sets to work the right way about getting it.

An interesting piece of information is that slot mechanism has been designed for fifteen types of Service aircraft, and that automatic slots are being fitted to Bristol Fighters at the rate of six per week.

Information might have been given as to whether the latest types of aircraft with which squadrons are being re-armed are also being fitted with slot mechanism. There seems little object in equipping Bristol Fighters of 1917 vintage with slots if the latest Bristol Fighter replacements and D.H.9a replacements are being delivered to squadrons without slots.

Ground Vehicles.

Another interesting piece of information is that the R.A.F. is being equipped with new mechanical transport, because the existing vehicles, some of which have been in use for over ten years, are not worth reconditioning. Certainly it is about time that the old war-time tenders and the assorted makes of motor-lorries were replaced, though every credit is due to them for having stood up so long to desperate driving.

The new transport vehicles are Morris six-wheelers, a machine that has a marvellous aptitude for travelling over rough country. In the Morris the four back wheels are mounted on a kind of universally-jointed bogey-truck, which can put itself into the most amazing attitudes and still drive efficiently.

This is precisely the kind of vehicle which is wanted, only for dashing about uneven aerodromes, but for e cating wrecked aeroplanes from any sort of country in w they happen to descend. It should be valuable to the Fl Services of the Dominions Overseas, and of foreign Nati and to operators of Civil Aerodromes all over the W Such a vehicle equipped to work as a combined fire-eng ambulance, and break-down wagon, should be stan equipment on every aerodrome.

One gathers that the 15.9 h.p. Morris saloon is to be in future as what the irreverent used to call "The I Hat's Gin Palace" and that Morris touring cars are t used for ordinary runabout work. So the good Mr. M comes out in a new phase as the Universal Provide motorists.

Parachutes.

A note on parachutes discloses the interesting fact over 75% of R.A.F. machines are now so equipped and the percentage will rise to 86% this year. But the asto ing statement is made that sea-going aircraft have not been fitted with parachutes because, with its present of attachment, the parachute involves the risk of drow the wearer.

The Memorandum says that a new quick-release gear been recently designed which is expected to solve this culty. Personally, if one were flying a sea-going air one would take the risk of drowning in preference to risk of being burned in the air or smashed on the through not having a parachute. And one imagined every conceivable form of quick release gear had designed and tried-out ten years ago or more.

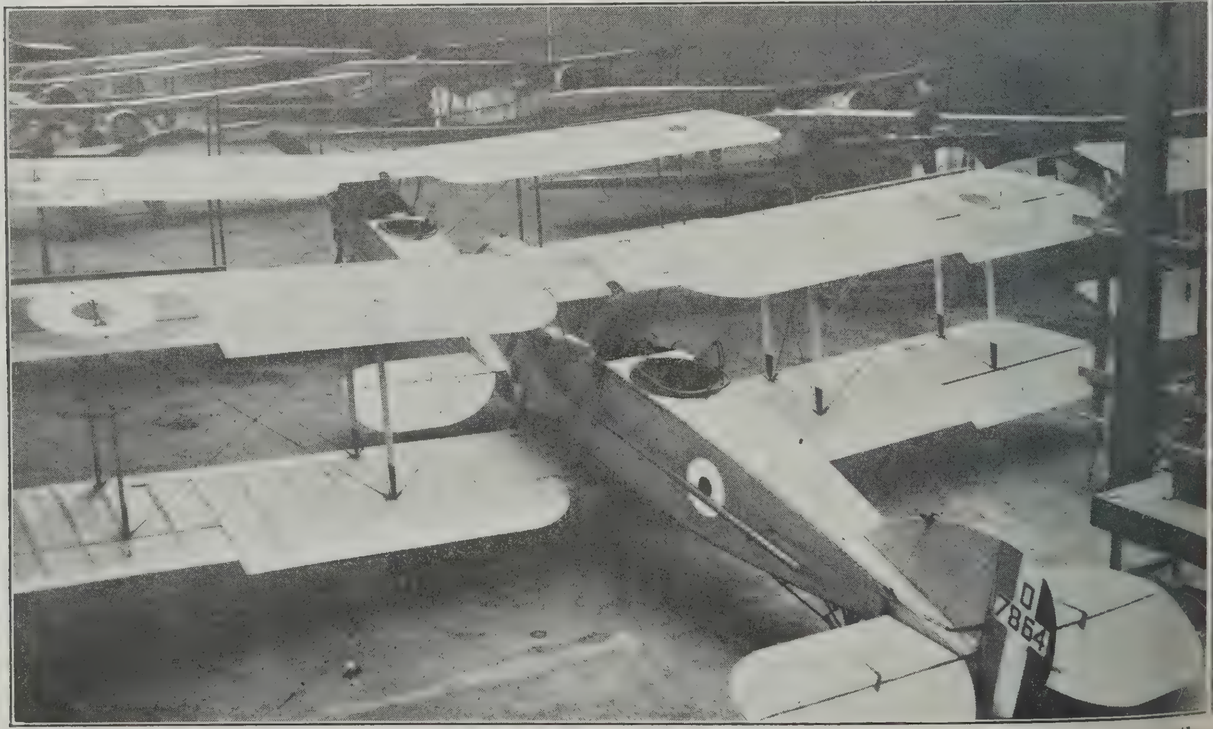
This piece of information looks as if the official mind gone back to the war-time days when parachutes were approved because they were not 100% efficient—regar of the fact that any pilot would have been glad of a chute which was only 50% efficient. One chance in tw getting out alive from a burning or broken aeroplan better than no chance at all.

Development.

The section on Research and Technical Developme interesting. It states that work is to begin on fourteen types of aircraft, including both a high-speed and a specification.

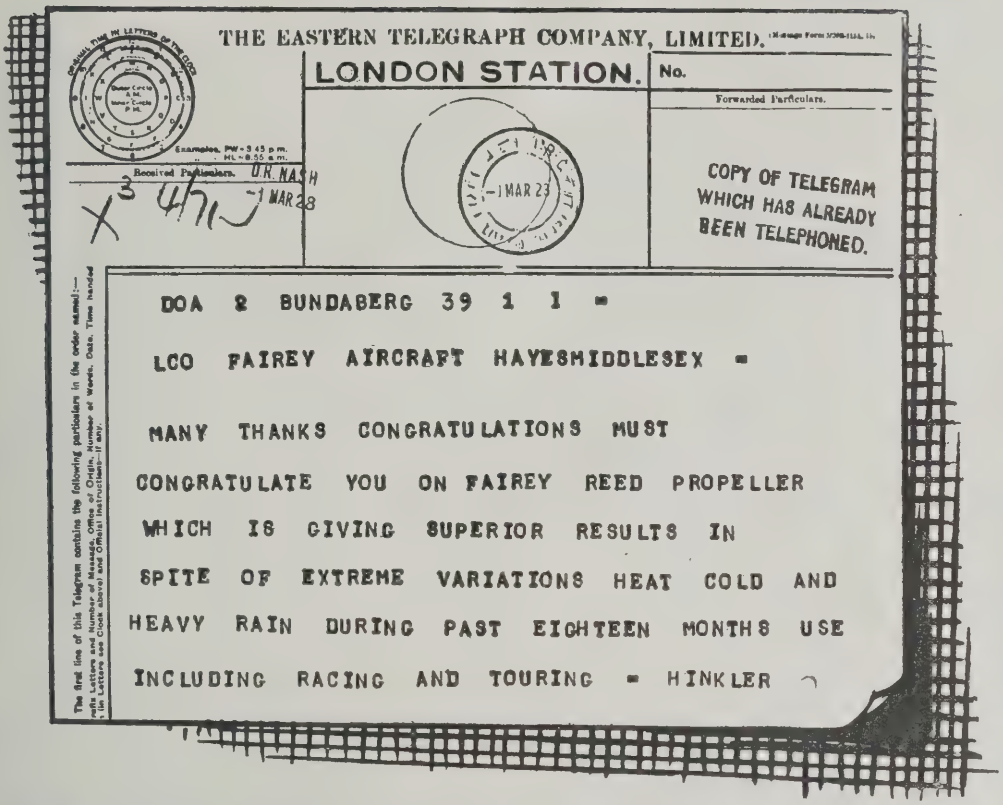
It is about time we did think about a high-speed spec tion, considering that our fastest machines in servic about 140 m.p.h., and we know that we can build machines to do well over 200 m.p.h.

We are also told that aero-engine development cove wider field "owing to the advance made in basic probl such as the gearing-down of propeller speed and methods of cooling." There is nothing particularly ne gearing-down airscrews, and one cannot discover that new methods of doing so have been discovered within last ten years. And as to cooling, some improvement



SLOTTING THE BRISFIT.—The first batch of Bristol Fighters being fitted with the automatic slot at the works of Handley Page Ltd. at Cricklewood.—(*"Aeroplane" photograph.*)

HINKLER'S GREAT FLIGHT



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ENGLAND TO AUSTRALIA IN 15½ DAYS

MR. BERT HINKLER'S flight from London to Australia on an Avro "Avian" has once more afforded ample proof of the ability of the Fairey Metal Airscrew to give the utmost reliability and at the same time to secure the best possible cruising speed under the severe conditions imposed by a flight of this nature.

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tainly has been made in cooling air-cooled engines, but one has not struck anything in the nature of a new method.

Perhaps the R.A.F. Radiator Experts have heard something of the method adopted by Mr. Frank Lockhart, Mr. Malcolm Campbell's American competitor, who managed to get something like 400 h.p. out of an engine of 3 litres capacity and kept it cool by pumping his cylinder-water through a box full of ice. One remembers that some years ago, when the R.A.F. were unable to do long reconnaissances in 'Iraq because their engines boiled their water away, an intelligent General Officer suggested that they might do better if their ice ration from the Army were increased. He may only have been a little in front of his time.

THE R.A.E. AT SEA.

Our old friend the Royal Aircraft Establishment at Farnborough is presented this year with £407,000 instead of £390,000. This increase is excused by additions to the power plant and modifications in the spinning tower. The latter implement is presumably where the local experts labour over erroneous experiments with airscrews and prove to their own satisfaction that metal airscrews will not do the work which they do do.

The information is given that a seaplane testing tank is to be built in which models of seaplane hulls and floats can be tested at higher speeds (the Memorandum says "velocities," which is not the same thing) than have hitherto been possible in the Froude marine tank at the National Physical Laboratory.

If the new seaplane tank be run intelligently, and if those who run it be willing to co-operate with the Aircraft Industry, instead of cornering the tank and its results for their own experiments and glorification, this tank may be a very good investment. The N.P.L. tank is intended primarily for models of ships, and is not particularly suited to the high speeds of seaplanes or flying-boats. Also, one gathers that the officials who are particularly concerned with the N.P.L. tank are not very much interested in aircraft and are inclined to resent having to speed-up their apparatus, and their methods, for the benefit of the Aircraft Industry.

One hopes that the Staff at the R.A.E. will not forget to salt the water in their tank, and that they will put a blower at one end to make real waves. Working out the precise degree of salinity, and the exact amount of chemicals other than salt needed to give the proper viscosity in proportion to real sea water, and the amount of blow needed to raise real waves, all to give a theoretically perfect scale-effect to the models and the speed at which they are to be run, ought to provide the Staff with the kind of work they love. And it will keep them busy for years before they will admit that the tank is fit to use.

VARIABLE DENSITY.

Another valuable piece of information is that a variable-density wind-tunnel is to be constructed at the N.P.L. When one was in America three-and-a-half years ago, the U.S. National Advisory Committee for Aeronautics had already been running a variable-density wind-tunnel for a year or more. It was designed by a German engineer, whom the Committee bought from Göttingen just after the War 1914-18, and in it they had already discovered things about streamline forms which have not yet penetrated to the intelligence of a number of our leading aircraft designers.

The Memorandum delivers itself of the statement that "in this form of wind-tunnel, which has been found of great value in the United States, the atmospheric density, which is one of the variables affecting the characteristics of aerofoils and aerostructures, can be increased so as to obtain from models data which are more directly comparable with full-scale conditions."

This would give one quite a distinct impression that aerofoils and aerostructures (ghastly expression!) ought to be varied in form while flying to suit the varying atmospheric density in which they have to work at varying heights.

The interested but uninitiated may like to know that the real beauty of the variable-density wind-tunnel is that with compressed air at comparatively low speeds one can arrive at something like the streamline shapes best suited for very high speeds in ordinary air. Which is why America won the Schneider Trophy and held it for four years, and why for five years American pursuit ships have been about fifty miles an hour faster than ours.

What we need quite as much is some apparatus to measure the variable density of the minds of our aerodynamic experts. If we had that, the sound practical men in charge of Technical Development might get along faster with the good work they are doing.

Finally under this section the Memorandum says that "new light has been thrown on the forces involved in the autogyro system by two minor accidents." They did not seem very minor to the pilots who were in them.

Also, with an unctuous air, the Memorandum remarks, "An experimental machine has made a cross-country flight of 35 miles, the longest cross-country flight yet to the cr
of an aircraft of the rotating wing type." The credit
believes belongs to the personal courage or recklessnes
Señor Don Juan de la Cierva rather than to the
Ministry's Technical Department.

AIRSHIPS.

Airship people will be encouraged by the fact that
Estimates this year provide for the completion of R.100
R.101 and their flying trials in this country. R.100,
Capitalist ship at Howden, is nearly ready. R.101,
Socialist ship at Cardington, is making good progress.

The information is given that the main girder work
R.101 is being manufactured by Boulton and Paul Ltd
Norwich,—whom the compiler of the Memorandum
"Messrs.," in defiance of orthological exactitude, a lim
company being a singular entity without soul to save
body to assault.

We are also told that a new type of heavy-oil compress
ignition engine (in other words, Diesel) has been develo
by "Messrs. Beardmore" for this airship. One hopes
the experimental flights on the ship will be made
engines of thoroughly well-known type, so that the
of the ship with known power-plant can be judged be
introducing the further experiment of a new type of eng

The Beardmore Diesel-type engine is most interest
and, if proved successful should be peculiarly suited to
ships. But, until it has been thoroughly tested in all
sible conditions there seems to be undue risk in actu
fitting it to a big ship which is itself a costly experiment

We are told also that a site for a mooring-mast has
selected by the Canadian Government near Montreal
that the South African Government will soon decide abo
site in South Africa. Investigations for sites are proc
ing in Australia and New Zealand. The mooring towe
Ismailia in Egypt is finished and trials of the mooring
have recently been made with a kite-balloon at the m
head.

Incidentally the compiler of the Memorandum insists
writing "a mooring tower base," which suggests that so
consideration has only been given to the lower end
mooring tower, with the intention of erecting the mast
tower, later on that base. Why not simply call the w
thing a mooring-station or a mooring-mast to distinguis
from an airship shed?

The second shed at Cardington was begun in July
One has not seen it but one hopes that it is far enough a
from the other shed to avoid any chance of one blow
up if the other catches fire, as happened at one of the
airship stations in Germany during the War, when, ow
to an incendiary fire in one shed, five sheds, complete
airships, went to glory.

WORKS AND BUILDINGS.

Under Works and Buildings we are told that work i
begin on the permanent buildings of the Cadet Colleg
Cranwell. The Memorandum admits that this is "
overdue work."

Also work is to begin at Hendon for the accommoda
of one regular and one non-regular squadron. One w
have imagined that there were enough permanent build
at Hendon already to accommodate about five reg
squadrons. At any rate there is plenty of shed room for
machines. And the old hotel at Hendon used to accon
date the personnel of considerably more than two squad
during the War.

The old Seaplane Station at Cattewater is to be re-op
for a flight of new flying-boats.

Actually the most interesting information about the
jected expansion of the R.A.F. is to be found in the
mates themselves under Vote 4, for Works and Buildi
The schemes for new stations and the expansion of exis
stations are startling,—as will be seen hereafter.

CIVIL AVIATION.

Under Civil Aviation much play is made with the s
ment that Croydon is now an up-to-date air terminus.
may have the biggest buildings. But as an air term
for the creation of airmindedness it is not a patch
Tempelhof.

One gathers that some provision is to be made for
general public to see the pretty aeroplanes without le
hindrance. But if the Air Ministry were far-sighted en
it would make the place a genuine attraction and a plea
resort for the general public.

When he was in London recently, Mr. Lester Gar
formerly publisher and proprietor of *Aviation*, the lea
American aircraft paper, and now a kind of Ambass
General for International Aviation, made the brilliant
gestion that the higher authorities of all countries sh
call their leading civil aerodromes Air Parks, and not
Ports. He argued very rightly that the phrase air-

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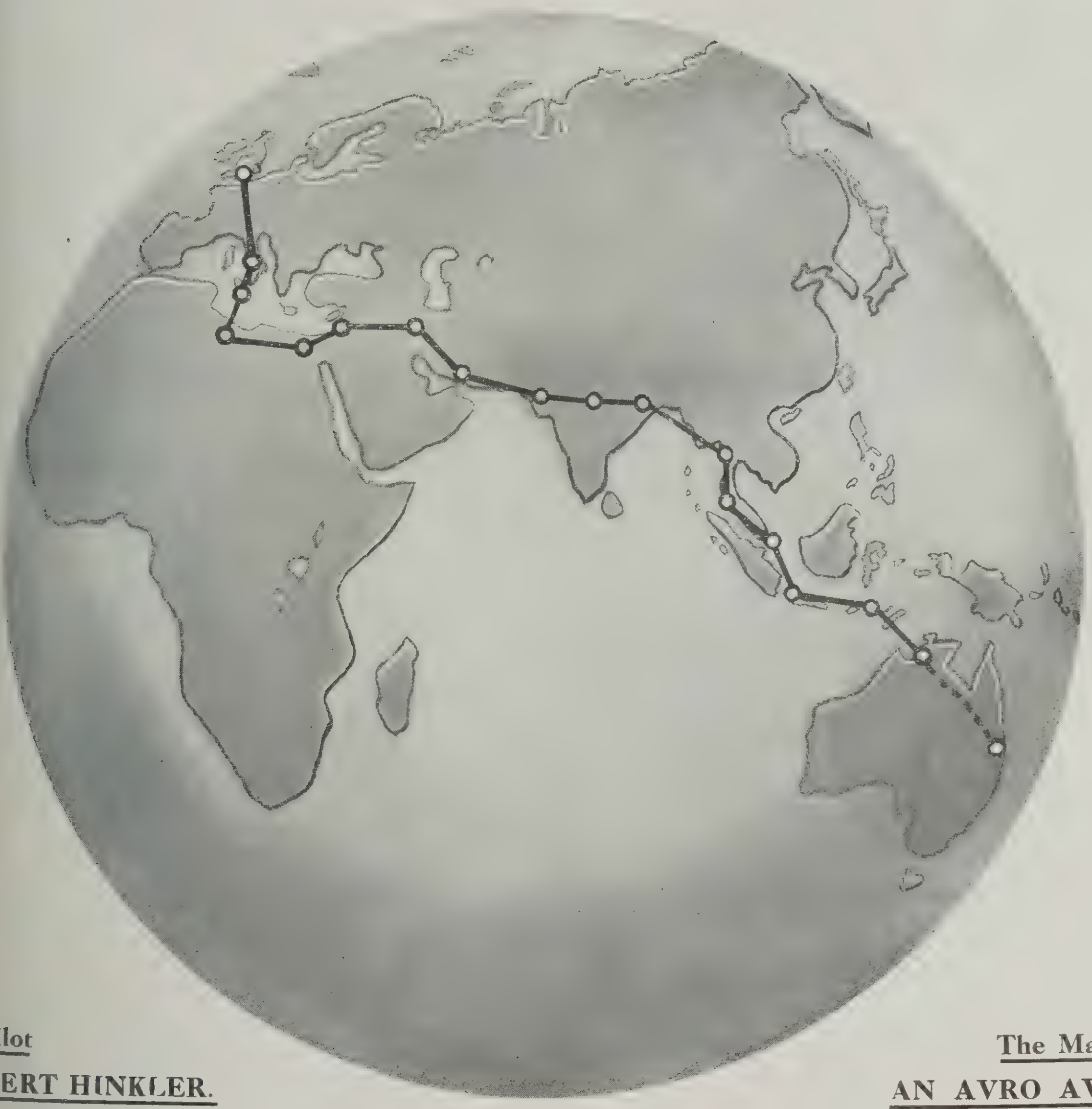
HALF WAY ROUND THE WORLD

ON A 30-80 h.p. A.D.C. CIRRUS ENGINE.



Pilot
BERT HINKLER.

The Machine
AN AVRO AVIAN.

PROOF—IF PROOF WERE NEEDED!

MR. BERT HINKLER HAS CABLED US AS FOLLOWS:—

"THE CONTINUOUS RELIABILITY AND SMOOTH RUNNING OF MY 'CIRRUS' ENGINE DURING THE WHOLE OF THE FLIGHT ALMOST BECAME MONOTONOUS NO REPLACEMENTS AND INSPECTION AT DARWIN SHOWED ENGINE TO BE IN EXCELLENT CONDITION."—HINKLER,

Manufacturers

A.D.C. AIRCRAFT L^TD.

REGENT HOUSE,
89, KINGSWAY, LONDON, W.C.2.

Contractors to the BRITISH AIR MINISTRY and most FOREIGN GOVERNMENTS.
Constructors of "CIRRUS," "AIRDISCO" and "NIMBUS" Aero Engines.
Constructors of "MARTINSYDE" Types of Aircraft.

Airdisco, London. Telephone: Holborn 4076-7-8 suggests docks and shipping, and is not likely to attract the tax-paying public, whereas if they are called air-parks, and if comfort and entertainment is provided for the public, the Taxpayer will in time come to regard them as places of public resort, and so will become more airminded.

One presents this suggestion for the serious consideration not only of the Director of Civil Aviation, but of all municipal authorities who may be thinking of laying out aerodromes.

Something of this idea inspired the original organisers of Croydon Aerodrome when, under the intelligent supervision of Major Greer, notice-boards were erected showing the arrival and departure of all machines on the air-lines during the day. Also a large-scale map was put up, on which strenuous endeavours were made to show the position of each machine on each air line at frequent intervals.

Everything was in quite an elementary stage then, but at comparatively little cost a far more elaborate arrangement on similar lines for the entertainment and education of the public could be put up at the new aerodrome.

An interesting point in this section is that £35,000 is included "for the purchase of part of the Waddon Aircraft Factory which adjoins the aerodrome, as an economical means of supplementing the hangar accommodation there." In other words, the Taxpayer is paying £35,000 to buy back part of the premises which were practically presented to the Aircraft Disposal Company.

A well-deserved compliment is paid to the efficient working of Imperial Airways Ltd. (This time the compiler does not call the firm Messrs.) and attention is drawn to the highly-efficient way in which the Cairo-Basrah section has been worked.

Perhaps wisely, no reference is made to the fact that people who arrive in Cairo from Basrah in two days are liable to spend five days in quarantine on the aerodrome at Heliopolis because some wretched 'Iraqi in Baghdad or Basrah has developed a pain in his stomach which is feared by an 'Iraqi doctor to be a case of cholera. As cholera seems to be endemic in 'Iraq, not to mention in Egypt itself, this possibility is likely to cramp the style of airways in the East unless something sensible is done about it.

As to Light Aeroplane Clubs the statement is made that thirteen Clubs have now been approved under the new scheme of subsidy, up to £2,000 apiece.

The Meteorological Department is allowed an increase of £9,000. This is now quite one of the most efficient organisations under the Air Ministry, and it well deserves the extra money. The statement is made that the increase arises from the growing demand for information made by Aviation in its various branches. Apparently seafarers and tillers of the soil are content to muddle along in their old-fashioned way.

The Air Ministry itself has had £30,000 docked from its cost. One hopes that this indicates a decrease in the amount of unnecessary work done on the Civil Service side.

SOME OF THE FIGURES.

Turning now to the figures in the Estimates, we find comparatively slight alterations in Vote I., for Personnel. There are 5 more Wing Commanders than last year, 4 more Squadron Leaders, 54 more Flight Lieutenants, 98 fewer Flying Officers and 61 more Pilot Officers. Presumably the necessary number of pilots to make work for the additional Flight Lieutenants and Squadron Leaders is made up by Airmen Pilots.

Officers in the Stores Branch have decreased by 8 and officers in the Accountant Branch have increased by 4. Also there are 2 more Chaplains.

Incidentally it is interesting to note that 4,425 civilians are employed in the Training Depots and Stores Depots.

Vote 2,—Quartering, Stores, Supply and Transport, calls for no comment.

Technical Stores.

To those concerned with the Aircraft Industry the most interesting figures are those under Vote 3,—Technical and Warlike Stores (Including Experimental and Research Services).

The total amount for 1928 is £6,567,000 as against £6,424,000 in 1927, which shows an increase of £143,000. But it must be remembered that £17,000 of this goes to the R.A.E. at Farnborough. Also the real amount is complicated by the fact that in 1927 Appropriations in Aid amounted to £2,065,000 whereas this year they only come to £1,563,000.

The amount allotted for complete machines is £2,955,000 as against £2,930,000 last year. But it must be remembered that not all of this goes to the Aircraft Industry for a certain amount of it goes to the R.A.E. for experimental work.

Complete engines are allotted £1,533,000 as against £1,574,000 last year.

Spares, Parachutes and Miscellaneous amount to £700,000
as against £900,000 last year and Engine Spares are £500,0
as against the same figure last year.

One would be better able to estimate what these figur
really mean to the Aircraft Industry if any indication we
given of the amount which was under-spent in the pa
twelve months. So far as one could gather six months a
there seemed no earthly possibility of the Air Ministry ev
being able to spend anything like the amount of money whi
was voted in 1927 for new machines and engines.

Some attempt was made to spend most of the money
rushing orders during the last six months. But quite
considerable amount must have been returned to t
Treasury. At any rate, an allowance of £350,000 is made
the estimated under-expenditure for 1928-29.

As usual, the expenditure on the Royal Aircraft Establis
ment is absurdly high for the amount of good which is do
by that Establishment. Possibly the new Chief Superi
tendent may induce a higher speed and a higher quality
work, and so we may get better value for it in future. B
the wages paid show the absurdity of expecting anythi
like first-class brains in that Establishment.

Out of 293 people on what might be called the Techni
Staff of the Establishment only 27 are paid wages above th
which could be earned by a fairly competent counter-ha
in a draper's shop. And it is ridiculous on the face of
that those 27 officials, themselves under-paid, should
allowed to do practically what they like with nearly half
million pounds of the Public's money.

Among the smaller figures of Vote 3 the expenditure
Instruments is reduced by £10,000, and on Photograp
Equipment by £10,000. Armament is increased by £7,0
but Ammunition is decreased by £74,000. (Presumably t
Government of 'Iraq will pay for the few hundreds of tons
bombs and ammunition which the R.A.F. will use before t
Wahabis have been converted to peace or pieces.) Wirel
equipment is decreased by £11,000 and Electrical Equipme
is increased by £1,000. So altogether it looks as if the tech
cal equipment of the R.A.F. is not likely to improve.

Mechanical Transport Vehicles go up from £95,000 l
year to £175,000 this year, most of which presumably go
to the excellent Mr. Morris of Oxford. On the other ha
Mechanical and other Transport Spares are decreased
£15,000.

The allowance for Petrol this year is £430,000 as agai
£475,000 last year. At first sight this might seem to indic
a decrease in the amount of flying to be done this ye
But probably it is due to the fact that preliminary traini
in future will largely be done on De Havilland Moths a
on Avros with Armstrong-Siddeley Lynx engines, instead
on Avros with rotary engines which consume an enorm
amount of petrol.

On the other hand, it is difficult to see why Lubrica
should go up from £77,000 last year to £90,000 this year,
the abolition of rotary engines ought to make a big
decrease in the use of lubricants than in petrol. Perhaps
increase may merely be due to a drop in the amount
lubricants in stock at the end of 1927.

Under the sub-heading of Airship Development a num
of figures are given which will be of great interest to th
who are deeply concerned with airships, but they are
long and complicated to be quoted here. The totals sh
that £380,000 is allocated for airships this year as agai
£362,000 last year.

There is interest in noting under the heading "App
priations in Aid," that the Admiralty grant in respect of
Fleet Air Arm is £885,000 this year against £704,000 l
year. So the Fleet Air Arm is evidently going to have n
machines, even if R.A.F. Squadrons do not.

Projected Expansion.

Study of Vote 4,—Works and Buildings,—discloses so
quite interesting information apart from figures. For
ample, a perfectly new station is to be constructed at Abi
don at an estimated cost of £360,000. Boscombe Down, wh
already exists, is to cost £271,000 to re-condition and
pand. An aerodrome and range accommodation is to
arranged at Bridlington at a cost of £25,000.

The Electrical and Wireless School is apparently to
moved from Flower Down to Cranwell at a cost of £53,
and the new Cadet College is to cost £260,000.

Filton is to have £137,000 spent on it, apparently a
station for an Auxiliary squadron. Yet it held two or th
squadrons easily during the War.

The station at Gosport is to be reconstructed at a cost
£300,000, and it is not at all a bad station even as it i
Hucknall, at Nottingham, is to have £45,500 spent o
to accommodate a Cadre squadron.

Martlesham Heath is to be altered and to have additio
accommodation at a cost of £200,000.

Aerodrome and range accommodation is to be provided
North Coates Fitties, and Donna Nook for £31,000.

ON HIS MAJESTY'S SERVICE

There can be no greater tribute o the Moth than s selection by he ROYAL IR FORCE.

THE MOTH

ELEMENTARY & ADVANCED TRAINING.

Avion d'École.
Schulflugzeug.
Avión-escuela.
Avião de escola.
Aeroplano da scuola.
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STAG LANE AERODROME, EDGWARE, MIDDLESEX.

Telegrams : Havilland, Phone, Colindale. *Telephone :* Colindale 6160-6163.

Alterations and additions to accommodation at Northolt will cost £104,500.

The new station at North Weald will cost £239,000.

Accommodation for the Fleet Air Arm at Novar will cost £14,000.

There is to be an Aircraft Park at Peterborough costing £180,000,—presumably as a supply base for all the aerodromes in the Lincoln area. The reconstruction of Spittlegate station to make it into an F.T.S. will cost £200,000.

Aerodrome and range accommodation at Sutton Bridge and Holbeach will cost £30,500.

The old Home Defence aerodrome at Sutton's Farm, where the night-flying Camels used to live, is to be reconstructed at a cost of £260,000.

The new station for bombers at Upper Heyford is to cost £395,000.

Alterations and improvements at Worthy Down are to cost £156,000.

These colossal figures represent the estimates for the work which is needed, or planned, and in some cases the expenditure this year will only be a few tens of thousands. But the facts give some indication of what is to be done in the future.

One satisfactory piece of information is that up to March 31 of this year £408,000 will have been spent on Quarters for Married Officers.

Overseas Plans.

Any doubt as to whether we are ever likely to get out of Egypt or not in response to agitations of the Wafd may be allayed by looking at the projected expenditure on air stations in Egypt. This amounts to a paltry £350,000 on top of the millions which we have already spent on the stations as they already exist.

In 'Iraq only a few tens of thousands are to be spent this year. But we have already dug ourselves in there so solidly that there is little chance of our being shifted out by anything less than the collapse of the British Empire and the United States of America at the same time.

£200,000 odd is to be spent on additional accommodation at Malta.

The provisional estimate for the Air Station at Singapore is £496,000.—Somebody might have made it the level half million.

Estimates are under consideration for landing grounds on the air route from Calcutta to Singapore.

So one may assume that we intend to stop more or less where we are so far as the Far East is concerned, in spite of the Wafd, their Lordships of Rothermere and Beaverbrook, and all the other enemies of the British occupation of Egypt, Palestine, and 'Iraq.

Doctors and Teachers.

Vote 5 for Medical Services calls for little comment beyond the fact that doctors are not very well paid for the work they do. Most of them might do better on panel work.

Vote 6, Educational Services, which includes everything from the School of Store Accounting up to the Imperial Defence College, by way of the Staff College and the Cadet College, costs a mere £504,000 and seems to be money ve well spent.

But one would like to see more than £45,500 spent General and Vocational Training. Certainly not enough done as yet to educate officers and airmen desirous of obtai ing some "qualification in preparation for their return civil life."

One of the most likely professions in which a time-expir officer or man can get a good job on leaving the Air For is in air survey work. And so far as one can gather there nobody in the employ of the Air Ministry who can tea would-be air surveyors anything about such work.

Despite the fact that in any future war proper surveyi and map-making ought to be one of the most importa functions of the R.A.F. in co-operating with the Army, even with the Navy, there does not appear to be a so under the control of the Air Ministry who has a worki knowledge of scientific cartography—at any rate in conne tion with photography from the air. There are plenty good photographers in the R.A.F. and plenty of people w are quite expert at gumming together strings of phot graphs into a mosaic. But scientific map-making is anoth story.

Vote 7, Auxiliary and Reserve Forces, shows an increa of £54,000. They all do their best.

Vote 8, Civil Aviation, shows a decrease of £49,000, t total amount being £427,000. The figures displayed call little comment. The sum allowed for Technical Equipme this year is only £8,000, so evidently the Department Civil Aviation is not going to launch out wildly on expe mental aeroplanes.

Vote 9, Meteorological Services, shows deservedly a increase of £73,000.

Vote 10, Air Ministry, shows a decrease of £30,000, whi is apparently deceptive, because £48,400 is deducted fr the Air Ministry Vote through transferring the salaries the Meteorological Office from the Air Ministry Vote to t Meteorological Office itself. Actually there is a decrease £5,000 in the salaries of the Air Council and the Departm of the Secretary, and very rightly so, while, still m rightly, there is an increase of £5,000 in the Department the Air Member for Supply and Research.

Vote 11, Non-Effective Services, such as Special Rewar Half-pay of Officers, Disability Pay, Pensions, and so for account for £208,000.

Anybody who really likes playing with figures can get immense amount of entertainment out of the Air Estima for the 4s. 6d. at which it is published by the Statione Office. In the foregoing article one has merely dealt w outstanding figures.

The Debate on the Estimates was to be held on Mond last, the day before this paper goes to press. Obviously was impossible to deal with the verbosity of numero Members of Parliament on Press Day. Therefore one p poses to digest their speeches as far as possible during t next few days and to give readers of this paper a kind general idea of them in next week's issue of The Aeropla

C. G. G

THE KING OF AFGHANISTAN.

The diary of arrangements for the visit of the King and Queen of Afghanistan to this country includes an inspection on Saturday morning, Mar. 17, of the School of Technical Training (apprentices), R.A.F., and a display by the R.A.F. at Hendon during the afternoon of the same day. On Mar. 21 there will be an inspection of civil aircraft at the London Terminal Aerodrome at Croydon.

AN HONOUR FOR MR. HINKLER.

On Mar. 12 the Air Ministry made the following announcement :—

H.M. the King has been pleased to approve the award of an Air Force Cross to Mr. Bert Hinkler, D.S.M., in recognition of the distinguished service he has rendered to aviation by his recent flight in a light aeroplane from England to Australia.

LADY BAILEY'S JOURNEY.

On Mar. 9, the Hon. Lady Bailey left Croydon on a De Havilland Moth (Cirrus engine) on her way to South Africa, where her husband, Sir Abe Bailey, one of the leading mining magnates on the Rand, has been for some months.

The journey is a bold undertaking for anybody, but it is the more so for a woman alone and unaided. One would have imagined that having demonstrated her ability as a first-class pilot in England,—and having five particularly charming children to make life pleasant for her—Lady Bailey might have been content to rest on her reputation and to avoid the risks of such a flight.

Still, a wilful woman must have her way. And, just as the Hon. Mary Westenra was undefeatable when riding hounds, so is the Hon. Lady Bailey when she has set h mind on some aeronautical objective. May good fortune tend this latest adventure of one of the best sportswom the Anglo-Irish aristocracy has ever produced.—C. G. G.

The Hon. Lady Bailey, who is now on her way to Sou Africa on her De Havilland Moth G-EBST, has apparen been followed by poor weather for some considerable p of her journey so far.

Bad visibility forced her to land near Sacy (Oise), and s remained there for the night, flying on to Le Bourget Saturday morning.

On Sunday she flew on to Marignane, near Marseill where she arrived at 18.20 hrs., having flown from Lyons the face of a strong head wind.

On Monday Lady Bailey left Marignane at noon for Pi

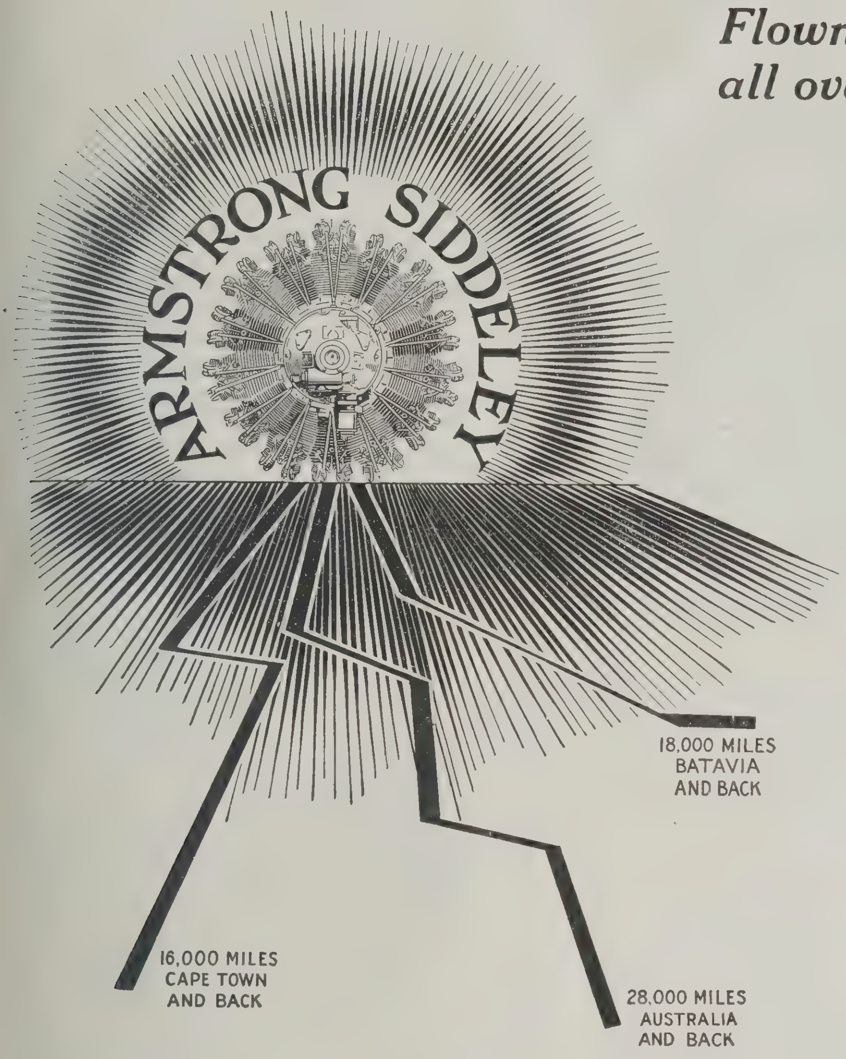
The machine which Lady Bailey is using is the origir "X" Moth which was flown by Capt. De Havilland la summer. It has been fitted with special fuel tanks, givi a range of 10 hours at cruising speed, but is in all oth respects a standard machine.

THE SCHNEIDER TROPHY RACE.

At a meeting of the "Schneider" Committee held Feb 29 it was decided that in order to comply with the ne regulations the 1929 contest should be held at a date betwe Aug. 24 and Oct. 5.

As the result of a visit of the Committee to Morecambe, was decided to make an aerial survey of a course in th district as soon as possible.

Flown and known all over the World


ARMSTRONG SIDDELEY
18,000 MILES BATAVIA AND BACK
16,000 MILES CAPE TOWN AND BACK
28,000 MILES AUSTRALIA AND BACK

The Greatest Flights
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were flown on
ARMSTRONG SIDDELEY
ENGINES

Armstrong Siddeley air-cooled radial engines are made in four sizes:

385-425 h.p. 14 cyl Jaguar.
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Ease of maintenance, economy of running, utmost reliability and a high degree of interchangeability of parts characterise these engines

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A 62

GIANT AEROPLANES.

A knowledge of history is always useful, and, as so many of the younger generation of aviators are apt to think that aeroplanes of large size are quite a modern development, the following letter which appeared in *The Times* of Mar. 8 is worthy of notice :—

> Sir,—After the interesting description given of the Beardmore Inflexible's first flight, your Aeronautical Correspondent makes a comparison of this machine with other large machines built abroad. He states "there is certainly no land 'plane in the world to-day with a larger span, nor, so far as can be recalled, one of equal weight, which has ever carried weight successfully." He has apparently overlooked the Handley Page "V.1500," which was constructed in 1917-18 for the purpose of long-distance bombing raids, and of which type a considerable number were manufactured.
>
> The normal stressed weight of the machine complete was 30,000 lb., the weight light 16,000 lb., the useful load, including petrol and oil, being 14,000 lb. On one occasion it flew from Cricklewood Aerodrome with 33,000 lb., all up weight. This machine was equipped with four 375 h.p. Rolls-Royce engines, and one had installed in it four 450 h.p. Napier Lion.
>
> One of these machines flew with pilot and 40 passengers for half-an-hour's flight over London; another accomplished the second flight from England to India; and another of the same type carried out many successful long-distance flights in America.
>
> The span of the machine was 126 ft., its length 64 ft., and its height 23 ft.
>
> So stable was the machine in the air that on one occasion on the flight from Belfast to London the pilot of one of these machines left the controls and, much to the astonishment of the crew, came into the forward compartment to make some inquiry in regard to the running of the petrol system.
>
> We would draw your correspondent's attention to these particulars, as they will form an interesting comparison of what was carried out in this country some ten years ago.
>
> (Signed) For and on behalf of Handley Page Limited,
> F. Handley Page, Managing Director.
>
> Cricklewood, N.W.2, Mar. 6.

In these days when everybody seems so careful about everybody else's feelings perhaps it may be tactless, but it is at any rate of interest, to add that these machines were particularly designed to bomb Berlin, and that the machine which was flown to India—by a pilot who was then, one believes, the smallest officer in the Air Force—was used to bomb the Ameer's Palace at Kabul. Our erstwhile enemies, being always the last people to bear malice, will at any rate be interested in these facts.—C. G. G.

MR. HINKLER IN AUSTRALIA.

On Mar. 6 Mr. Hinkler left Bundaberg at 10.20 hours in his Avian for Brisbane after an eight-day rest at home. Before he left he gave the name of Hinkler Park to the recreation ground on which he landed on Feb. 27 by breaking a bottle of champagne over the park from the side of his machine.

He landed on Ascot racecourse, Brisbane, at 14.24 hours. He was welcomed by the Governor of Queensland, Mr. McCormack, the Premier of Queensland, the Mayor of Brisbane and a crowd estimated to number twelve thousand.

After a brief speech of welcome by the Governor, Mr. Hinkler was driven into the city in a decorated motor-car escorted by a guard of mounted police and followed by his Avian on a lorry. His progress through the decorated streets was the subject of a great demonstration of enthusiasm.

On Mar. 7 he was entertained by Tattersall's Club, where he was presented with a cheque for £261, subscribed by members. He was later fêted by the Royal Automobile Club.

On March 8 he visited the offices of the *Brisbane Courier*, where he received a cheque for £1,000, the first instalment of a fund raised by the newspaper. In the afternoon he was entertained by the Brisbane Club, and in the evening he was the guest of the Queensland Cabinet at a private dinner.

On March 11 he left Brisbane at 06.30 hours and arrived at Mascot Aerodrome, Sydney, at 15.30 hours, after a brief stay for lunch at Newcastle. He was met at Narrabeen, 15 miles north of Sydney, by an escort of ten aeroplanes. His progress from Brisbane had been reported by frequent broadcast bulletins to the huge crowd, whose excitement reached its greatest height as Mr. Hinkler and his escort emerged from a cloudbank to the north. He circled for several minutes over the aerodrome while the others landed. There was a roar of cheers and "co-ees" from the crowd of 50,000 and the notes of thousands of klaxons. The cheering increased as he glided down and landed exactly up to time and almost in front of the reception platform. He was welcomed by Mr. Bavin, the Premier of New South Wales, and other personages.

Mr. Hinkler then drove to Government House, the road to which was lined thickly with crowds of cheering citizens. Admiral Sir Dudley De Chair, the Governor, and Lady De Chair welcomed him. In the evening Mr. Hinkler had a great reception from a large crowd in the Sydney Stadiun and later he was entertained by 1,000 ex-Service men an their wives in the Town Hall.

On Mar. 12 he was given a civic reception at the Tow Hall, where 10,000 citizens were present. After the civ reception he was entertained at lunch by the Queenslar residents in Sydney. In the afternoon he flew over Sydne in his Avian and in the evening he was entertained at dinn by C. C. Wakefield and Co., after which he attended a ga performance at His Majesty's Theatre.

AVIATION IN NEW GUINEA.

In July, 1927, a company known as Guinea Airways Ltd with a capital of £50,000, was formed to take over the wor of the company known as Guinea Gold (N.L.) which ha been operating in the Salamoa goldfields district of N. New Guinea since April, 1927.

Since its inauguration on April 18, Guinea Gold has mai tained a service of ten trips per week between Wau Cree and Lae with a D.H.37 with only two delays due to engi trouble.

From April to July, 1927, the total number of passenge carried from Lae to Wau Creek was 28 and from Wau Lae 56. The total amount of cargo was 26,905 lbs. Th total flying time in the tropics with the D.H.37, flown Mr. A. E. Mustard was 145 hrs. 45 mins.

Late in 1927 Mr. Mustard proceeded to Europe and it reported that he has purchased for the new company Junkers monoplane with interchangeable floats and whee at a cost of approximately £8,000 landed at Lae, New Guine

Flt. Lt. W. E. Gardner, D.S.C. (late R.A.F.), has join the flying staff of Guinea Airways Ltd.

Another company, known as the Bulolo Goldfields Co pany, is operating over the same route. This compa started in June. In one month this company carried 7 pa sengers and 1,451 lbs. of freight from Lae to Wau and 6 pa sengers from Wau to Lae.

The Bulolo Goldfields Company has a D.H.9 and a Brist Tourer, both with Puma engines, and the pilots are M R. J. P. Parer and Mr. C. D. Pratt.

A third company, known as the Morobe Trading Co., h a D.H. Moth employed on similar work, and quite recent Mr. Pentland and Mr. Royal have formed a partnership operate still a further passenger and freight service betwe Lae and Wau with a D.H. Moth.

THE COLLIER TROPHY, 1927.

One of the highest distinctions open to an American connection with Aviation is the winning of the Colli Trophy, which is awarded each year by the Collier Trop Committee of the National Aeronautic Association "for t greatest achievement in aviation in America, the value which has been demonstrated by actual use during the p ceding year."

This year the Trophy has been deservedly awarded Mr. Charles L. Lawrance, who developed the Wright Whi wind engine. And none of his countrymen will grudge h the distinction.

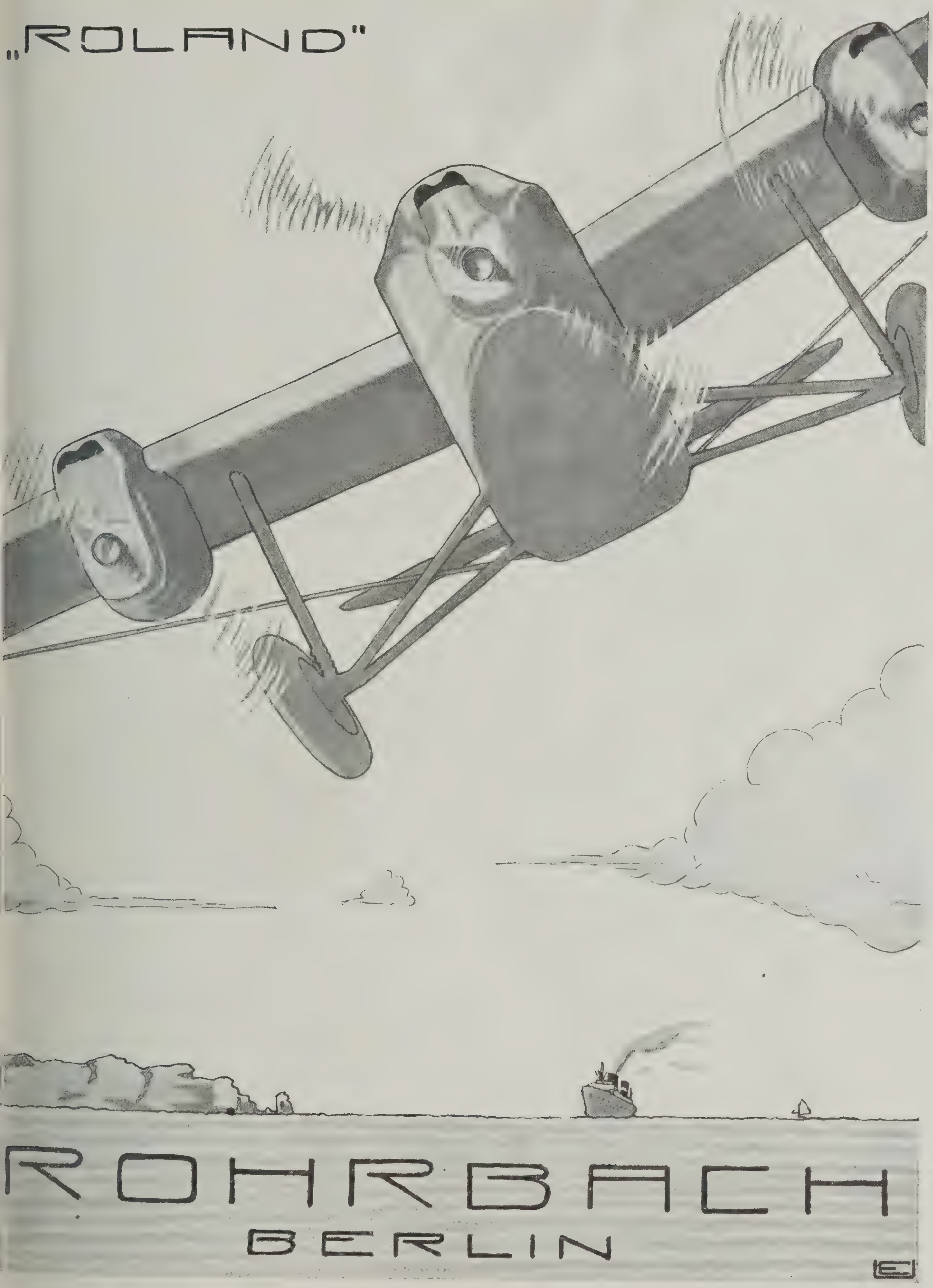
The first model of this engine was designed by Charl Lawrance himself in 1921. And, as *Aviation*, New Yo says,—"The present state of perfection has been broug by the farsightedness for the future of aviation in th country and the untiring energy of the designer."

Mr. Lawrance is a young man of wealth who has seen "to shun delights and live laborious days" for the she joy of his work. He spent much money on his hobby befo he looked like seeing any profit on it. And his present su cess is excellently deserved.—C. G. G.

CANADIAN PREFERENCE FOR BRITISH AERO-ENGINES.

According to information received from the office of t High Commissioner for Canada, the Minister of Finance his Budget Speech delivered in the Dominion House of Co mons at Ottawa on Feb. 16, made the following announ ment concerning the import of British Aircraft Engines :—

"The concession of free entry under the Brit Preferential Tariff for Aircraft Engines is extended fr July 1, 1928, to July 1, 1930. A drawback of 50% is to allowed on materials used in the manufacture of engi for aircraft after July 1, 1930, but such drawback will granted only when 40% of the production cost of finished engine has been incurred in Canada. Such engi imported from the United Kingdom will still enjoy a su stantial preference."



SCIENTIFIC DESIGN

necessary in aircraft construction to obtain ally good performance.

ook at the "ROHRBACH-ROLAND"!

very detail as well as the whole structure shows that this finest of all passenger aeroplanes is a striking example of scientific design, with the result that every horse-power carries more pounds in the "ROLAND" than in any other aeroplane of similar size.

FLIGHT LIEUT. KINKEAD.

On Mar. 12, late in the afternoon, Flt. Lt. S. M. Kinkead, D.S.O., D.S.C., D.F.C., flying the Supermarine S.5 (Napier engine), on which he was about to attempt to beat the World's Speed Record, dived into the Solent near Calshot Light and was killed.

He had been waiting at Calshot for some weeks to go for the record. Official announcements were issued that the effort would be made early in March. For some unexplained reason those responsible for the arrangements delayed till the recent spell of fine weather had passed, and the first tests on the water were made under winter conditions.

The machine itself was built for the Schneider Trophy Contest and was taken to Venice as a spare. Since its return, modifications, which have not been published, have been made to it—but one does not imagine that they can have been such as to affect its structure or its aerodynamic qualities.

Flt. Lt. Kinkead flew the machine for the first time on Mar. 11, and it then seemed to be quite satisfactory—as did its engine.

Owing to the extremely cold weather special arrangements were made to keep the oil and water in the radiators electrically heated while the machine was in its shed waiting to be flown—and, barring the weather, all seemed well.

Flt. Lt. S. M. Kinkead, D.S.O., D.S.C., D.F.C., R.A.F.

On Mar. 12 Flt. Lt. Kinkead took the machine out in a flat calm. According to onlookers he had at first a little difficulty in getting off, owing to having to reach a speed of something over 100 miles an hour on the water before getting to the lifting speed of the machine. But at his second attempt he got off easily.

He flew over to the Isle of Wight, and then came down towards Calshot, where was the beginning of the measured three-kilometre course. And as he neared Calshot Light the machine dived into the water.

A high-speed coastal motor-boat, which was on patrol in case of accident, made for the spot, but the only wreckage found were some pieces of wing—probably broken off on hitting the water.

If the wreck of the machine should be retrieved there is little hope that any reason for the accident will be discovered from it. Everything must have been broken up in the impact with the water.

As is usual in unexplained accidents, all kinds of theories have been put forward. And any theory is worth considering, not as an explanation of this accident, but as a suggestion of things to guard against in future.

One theory is that the waves thrown up in getting off may have so strained the structure of the tail unit that it collapsed when the machine was forced up to full speed on approaching the timed course. This is possible, but improbable when one considers the testing which its sister machines had at Venice, and which this machine had in its earlier flights.

Nevertheless, when one considers how air-pressures i crease for every extra few miles an hour at these terri speeds in the region of 300 m.p.h., and how nearly solid t air becomes, one may well believe that calculation of t stresses produced is well-nigh impossible. At the sa time Mr. Mitchell, of the Supermarine firm, is the kind engineer who takes no chances, and we may safely belie that he made full allowance of strength in his designs.

There is also a possibility that something froze up. frozen oil-pipe, or a water-pipe, or even the frozen lubrica in the hinge of a control-surface or in the slide of a contr connection, might upset things enough to cause a verti deviation which, when near the water at such speed, wou wreck the machine.

Apart from that, there are the possibilities of somethi happening to the pilot himself—ice on the screen in t cowling, or ice on his goggles might blind him, or even t glare of the sun, low on the horizon.

But there are too many possible causes to allow the di cussion of any more. The fact remains that we have lo one of the best men and one of the finest officers in t Royal Air Force.

At heart one cannot help feeling that if those who we responsible for the movements of the Schneider Team Venice had seized their opportunity and had set this m chine or the winning machine to capture the Speed Reco at Venice we might have had the Record six months ag and Kinkead might have been alive to-day. Still, such the luck of life, that if Kinkead, or one of the others, ha captured the Record then, he might have been killed in simple accident at home—perhaps even in crossing London street.

To his friends, and even acquaintances, Kinkead w always known simply as "Kink"—a singularly inapposit if obvious, nickname, for never has there been a man w made more of a habit of thinking straight, talking straigh and living straight. If Kink had any enemies one has nev met any of them. All who knew him admired him equal as a pilot, as a fighting man, and as an individual.

Kink had that curiously quiet manner and voice whi seems to be the characteristic of all South Africans. consorted oddly with his war record. And yet it was pa and parcel of his kindliness to others, his dislike of adve tising himself, and that fine sportsmanship which enabl him to take his bad luck and his perilous descent in t Schneider Trophy Contest at Venice as all in the day work.

No epitaph can fit him so well as the words of the writ of the leading article in *The Times*,—

"We know nothing as yet, except the fact that a tri and gallant gentleman has gone to his death in the dari performance of a dangerous duty."

There is something of poetic justice in the fact that Ki kead, the most modest and self-effacing of men, should his death attain to the dignity of a *Times* leader—an hono which is reserved for the great ones of the Earth. Tho others will find him worthy company.—C. G. G.

[Full details of Flt. Lt. Kinkead's Service career will found under the Personal heading on page 374.]

FLIGHT LIEUT. MCINTYRE.

On Mar. 13, Flt. Lt. I. E. McIntyre, C.B.E., A.F.C R.A.A.F., was killed at Melbourne, when his machine crash during an exhibition flight.

Flt. Lt. Ivor Ewing McIntyre first came into prominen in 1924, as the pilot of the first seaplane flight round Au tralia. With Wing Cdr. S. J. Goble, C.B.E., D.S.O., D.S.C this officer, on a Fairey III.D seaplane, flew round the enti coastline, a total distance of 8,568 miles, in 90 flying hou

Again in 1926, but this time with Group Captain Willia D.S.O., O.B.E., and F-S. Trist, D.F.M., as passenger, made a 10,000-mile flight from Sydney to the British ma dated territories in the Pacific and back, on a D.H.50 se planes.

Apart from these two flights, Flt. Lt. McIntyre was sponsible for a large amount of routine flying of a valua nature, particularly in aerial survey work, test flying a parachute instruction.

In 1927 he resigned his commission in the R.A.A.F. become instructor to the South Australian Section of t Australian Aero Club and it was while serving with th flying club that he met his death.

By his resignation the R.A.A.F. lost a very valuable offic whose knowledge and ability could ill be spared by a count to whom the seaplane is of such vital importance.

By his death Australia has lost one of its most brillia pilots who, although no longer a serving officer, was serving well of his country by educating the Commonwealt through the Flying Club movement, to realise the value aviation in general. That he should be killed in a usele stunt flight is the irony of fate.—L. B.

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THE ROYAL AIR FORCE.

The London Gazette.

Mar. 6.

General Duties Branch.—Plt. Off. on probation R. J. Stone is confirmed in rank and promoted to the rank of Flg. Off. (Feb. 11); Flt. Lt. J. E. MacLennan is placed on the retired list at his own request (Mar. 7); Flt. Lt. J. R. F. Randell, D.F.C., is placed on the retired list at his own request (Mar. 3) (substituted for the notification in the *Gazette* of Feb. 28); Flg. Off. S. J. Gilbert relinquishes his S.S. comn. on account of ill-health (Mar. 7).

Medical Branch.—The following are granted perm. comns. in the ranks stated (Mar. 7):—Flt. Lts.—A. F. Cook, E. J. Jenkins, J. Magner, M.B. Flg. Offs.—L. Freeman, G. S. Strachan, M.B.

The following Flg. Offs. are promoted to the rank of Flt. Lt. (Feb. 23):—J. P. Hederman, E. J. Mockler, M.B.

Flt. Lt. C. V. D. Rose resigns his perm. comn. on appointment to a comn. in the R.A.M.C. (Feb. 16).

Reserve of Air Force Officers.—General Duties Branch.—The following are granted comns. in Class A as Flg. Offs. on probation:—R. P. D. Brailli, G. M. Cox, M.C., C. T. E. Smith (Mar. 6).

E. J. Brighton is granted a comn. in Class A.A. as Plt. Off. on probation (Mar. 6).

The following Plt. Offs. are promoted to the rank of Flg. Off.:—D H. B. Clark (Mar. 1); L. J. C. Mitchell (Mar. 6).

Flg. Off. S. S. Kirsten is transferred from Class C to Class A (Feb. 23).

The following are transferred from Class A to Class C:—Sq. Ldr. J. R. Howett (Mar. 4); Flg. Off. W. J. McDonough (Mar. 3); Flg. Off. F. R. Offord (Mar. 2).

Medical Branch.—Flt. Lt. J. C. T. Fiddes relinquishes his comn. on completion of service (Mar. 6).

Auxiliary Air Force.—Accountant Branch.—No. 602 City of Glasgow (Bombing) Squadron.—The following to be Plt. Off.:—J. R. Stewart (Dec. 21, 1927).

Appointments.

Week ending Mar. 12.

General Duties Branch.—Wing Commander R. F. S. Morton, to R.A.F. Depot, Uxbridge, whilst attending Senior Officers' War Course, 12/3.

Squadron Leaders J. J. Breen, to No. 55 Sqdn., 'Iraq, 23/2. F. H. Coleman, to No. 7 Sqdn., Worthy Down, 27/1.

Flight Lieutenants J. S. T. Fall, D.S.C., A.F.C., to R.A.F. Depot, Uxbridge, 27/1. G. M. F. O'Brien, D.S.C., to R.A.F. Depot, Uxbridge, 16/2. J. F. Lawson, A.F.C., to R.A.F. Depot, Uxbridge, 27/1. A. F. Lang, M.B.E., to R.A.F. Depot, Uxbridge, 27/1, to Air Ministry (Signals Branch), 1/3. G. S. Hodson, A.F.C., to R.A.F. Depot, Uxbridge, 14/2. R. L. Sweeny, to A. and G. S., Eastchurch, 29/2. F. J. Fogarty, D.F.C., to No. 30 Sqdn., 'Iraq, 23/2. R. Ivelaw-Chapman, D.F.C., to No. 70 Sqdn., 'Iraq, 23/2.

Flying Officers C. W. Booth, M.B.E., to Aircraft Depot, India, 28/2. L. T. Kerry, M.C., to Armoured Car Wing, 'Iraq, 23/2. J. E. G. Thomas and G. B. Beardsworth, to No. 28 Sqdn., India, 28/2. A. H. W. J. Cocks, to No. 60 Sqdn., India, 28/2. E. D. MacL. Hopkins and S. H. C. Gray, to No. 20 Sqdn., India, 28/2. T. E. Worsley, to No. 1 Wing, H.Q., India, 28/2. L. H. Anness, to No. 70 Sqdn., 'Iraq, 23/2. A. F. Merritt, to No. 55 Sqdn., 'Iraq, 23/2. W. J. Pickard and E. F. Wain, to No. 5 Sqdn., India, 28/2. L. T. Keens and K. C. Netherton, to No. 31 Sqdn., India, 28/2. H. R. F. Baxter, to A. and G. S., Eastchurch, 2902. J. W. White, to R.A.F. Depot, Uxbridge, 27/1. B. J. J. Nimmo and J. S. Dick, to R.A.F. Depot, Uxbridge, 16/2. F. Boston, to R.A.F. Depot, Uxbridge, 4/2. W. V. R. Nicholl, to Night Flying Flight, Biggin Hill, 27/1. J. McGuinness, to A. and G. S., Eastchurch, 27/1.

Pilot Officers J. W. Pease, to No. 31 Sqdn., India, 28/2. C. C. D. Williams, to No. 28 Sqdn., India, 28/2. I. McL. Cameron, C. R. Clarke, G. E. Klein, J. H. Lindell, J. F. McKenna and D. T. Saville, to C.F.S., Wittering, on appointment to S.S. Comns., 14/2.

Medical Branch.—Squadron Leader T. McClurkin, M.B., D.P.H., D.T.M. and H., to Far East Flight, 11/2. P. T. Rutherford, O.B.E., to Princess Mary's R.A.F. Hospital, Halton, 6/3. T. C. St. C. Morton, M.D., M.R.C.P., D.P.H., D.T.M. and H., to Pathological Laboratory, Halton, 12/3. F. J. Murphy, M.B., to No. 2 F.T.S., Digby, 8/3.

Flight Lieutenant T. V. O'Brien, M.B., to Pathological Laboratory, Halton, 12/3.

Flying Officers C. W. Coffey, to R.A.F. Depot, Uxbridge, 4/3. C. P. O'Toole, to Station H.Q., Bircham Newton, 5/3.

Stores Branch.—Squadron Leader J. Walker, to R.A.F. Depot, Uxbridge, 16/2.

Flight Lieutenants H. F. Webb and J. R. Gardiner, to R.A.F. Depot, Uxbridge, 27/1.

Flying Officers W. J. Cleasby and J. McCarthy, to R.A.F. Depot, Uxbridge, 16/2. C. Littlejohn, M.M., to R.A.F. Depot, Uxbridge, 27/1.

Accountant Branch.—Squadron Leader P. A. Simmons, to R.A.F. Depot, Uxbridge, 4/2.

Chaplains Branch.—The Rev. G. L. Robinson, D.S.O., to R.A.F. Depot, Uxbridge, 16/2.

The King's Levee.

His Majesty the King held a Levée at St. James's Palace on Mar. 6.

Among those in attendance upon His Majesty was Air Marshal Sir John Salmond, Principal Air Aide-de-Camp. Croup Captain P. F. M. Fellowes, Aide-de-Camp in Waiting, was also among those present.

The following Officers of the R.A.F. were among those presented to the King by the Secretary of State for Air:—Flt. Lt. A. Bayley, on appointment, Group Capt. the Hon. John Boyle, C.B.E., D.S.O., Flt. Lt. E. Brewerton, D.F on appointment, Flt. Lt. J. Bussey, on appo ment, Flt. Lt. C. Cahill, on appointment, Off. L. Cannon on appointment, Flt. Lt. C. lingwood, on appointment, Group Capt. I. Courti C.B.E., Flg. Off. A. David, on appointment, Flg. Off. Dearth, on appointment, Sq. Ldr. H. Champion de Crespig M.C., D.F.C., on promotion, Flt. Lt. O. de Putron, on pointment, Flt. Lt. G. du Boulay, on appointment, Flt. C. Hill, on appointment, Flt. Lt. R. Horniman, on appo ment, Flt. Lt. E. Ffoulkes-Jones, on appointment, Flt. Lt. Laing, on appointment, Wing Cdr. J. MacDonald, Wing T. Leigh-Mallory, D.S.O., on promotion, Flg. Off. H. M ford-Mathews, on appointment, Flt. Lt. H. McKenna, D.C. on appointment, Flg. Off. R. Money on appointment, Lt. S. Pope, D.F.C., on appointment, Flg. Off. V. Ross, appointment, Flt. Lt. E. Routh, on appointment, Flg. J. Sender, on appointment, Flt. Lt. E. Steddy, on appo ment, Flg. Off. R. Stone, on appointment, Flg. Off. R. Ta on appointment, Sq. Ldr. F. Workman, M.C., on motion.

The 1928 Cairo—Cape Town Flight.

The annual Service Flight, under the command of Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., which Heliopolis on Mar. 1, arrived at Khartum on Mar. 2, lakal on Mar. 6, and Nairobi on Mar. 7.

The personnel of the Flight includes Air Vice-Mar Webb-Bowen, Flt. Lts. O. R. Gayford, D.F.C., J. S. Adams and C. H. Flinn, and Flg. Offs. J. H. Woodin W. L. Dawson.

Group Captain Bettington.

Group Captain A. V. Bettington, C.M.G., whose appo ment to command the Home Aircraft Depot, Henlow, is d Feb. 22, is the son of the late Colonel Bettington, who distinction in command of irregular cavalry in South Afr He was born in 1881 at East London, Cape Province, S Africa, and educated at St. Andrew's College, Grahamsto South Africa. He joined the South African irregular mou Forces and served through the South African War of to 1902. In 1904 he joined the Johannesburg Mounted R and served in the Zulu War of 1906.

He and his brother Claude learned to fly on Bristol m planes on Salisbury Plain, and his Royal Aero Club c cate No. 326 is dated Oct. 15, 1912. Claude Bettington killed in an accident with the late Mr. Hotchkiss, w proceeding to Army Manœuvres in 1912.

Lieut. Vere Bettington went overseas with the Royal F Corps in December, 1914, and returned in June, 1916. returned to France in March, 1917, and served there December, 1918. He was made a Companion of the Distinguished Order of St. Michael and St. George in New Year Honours List of 1919 for distinguished serv during the War. He was three times mentioned in despatches.

After the Armistice he was appointed to command R.A.F. Station at Baldonnel, Ireland, and in June, he was appointed to command the R.A.F. in Ireland. was seriously injured in a flying accident in Ireland in and was placed on the non-effective list for 12 month

In October, 1923, he was appointed Air Attaché to British Legation in Buenos Aires and was awarded the Chi Order of Merit (2nd class) during his term of servic that country. He was promoted to the rank of Group Cap in July, 1927.

R.A.F. SPORTS AND PASTIMES.

Boxing Notes.

The following notes have been received from Sq. A. E. Pettingell, the Hon. Secretary of the R.A.F. Bo Association:—

The Inter-Services Boxing Association.

This meeting will be held at Halton on Mar. 14 and 15. At the of writing the Navy have not yet submitted their team but the have and on paper they appear to be very strong indeed. The meeting of the Boys of the three Services should be very intere and from what I have seen of the form of the R.A.F. the others have to be good if they are to be beaten. A special silver sta has been provided as a Trophy and each individual winner will r a replica of it.

The R.A.F. Individual Championships.

For various reasons the arrivals were considerably below the e but even then there were enough to make 72 bouts in all. The Air bouts this year were not quite up to standard and many of seemed to be slow, but the same cannot be said of the Officers, all went at it good and hearty. The best of the Airmen's bouts

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the finals between L-AC. Williamson and AC. Johnson, both of Henlow, and between Cpl. Brady of Worthydown and AC. Buchanan of Manston.

Normally it is extremely difficult to provide real Heavy-weights, but this year there were four entries in the Officers' class, all about 6 ft. high and weighing around 14 st. 7 lbs. (From Bombing Squadrons one hopes.—C. M. MCA.)

The Officers' Heavy-weight Final was the best bout of the evening, and provided a bout of real thrills and excitement was intense. I saw one well-known Officer, himself the terror of many fights, and a R.A.F. Champion, kick his neighbour, and another fell off his chair.

Time was called and Beamish sailed into his opponent, Chichester, with terrific right and left hand punches, mainly to the head, and brought him to the boards in the first round. Chichester landed a few, but it was clearly Beamish's round.

Time was called for the second and after some good exchanges into which both men were putting every ounce, Beamish caught Chichester with a terrific right to the jaw, which sent him through the ropes with half his body, head downwards, towards the floor. How Chichester managed to remain conscious and struggle back to stand up to his opponent inside ten seconds defeated everybody, but he did, and kept Beamish off until the gong.

With the rest over, he came up for the last round fresher than Beamish, who obviously had taken a lot out of himself in his tremendous effort to finish off Chichester, who from now on kept his head and boxed very cleverly, occasionally sending over a hard right, and soon had Beamish slogging round the red corner where he eventually sank down exhausted, the Referee awarding the fight to Chichester amid rounds of cheers and applause.

All agreed that they had never seen such a battle. To win two hard fights in one session stamps Chichester as a real Champion, while Beamish is to be congratulated for a very plucky show against a more experienced boxer, after having played a hard game of Rugger on Wednesday, and again on Thursday.

Of the other Officers' bouts, the Middles were the most interesting. Plt. Off. Maclean, a novice at the beginning of the season, fought strongly, and fully deserved his title.

A team of the R.A.F. beat the London University team in a boxing match at the Stadium Club on Mar. 9 by 13 bouts to four.

The R.A.F. Rugby Cup.

Worthy Down versus Manston.—The match in the semi-final round of the Rugby Cup Competition between Worthy Down (holders) and Manston was played at Andover on Mar. 10 and resulted in a win for Worthy Down by a goal and four tries to nothing. The winners included a good many of the team which won the Cup last year and their play showed the value of extended practice as a team. The forwards were fast and fit and well together and the backs handled well, ran straight and showed initiative and enterprise both in attack and defence.

Manston put up a very fine fight indeed but they had not the combination as a team nor the speed on the wings to hold their own but what they lacked in skill they made up in hard work and in spite of being without one of their forwards throughout the greater part of the game they went full-out the whole time and put up a very good show.

An unpleasant incident happened early in the first half when Plt. Off. D. L. Maclean, the Worthy Down scrum-half, was ordered off the field, after having been warned, for fighting. This, one understands, is the first and one hopes the last, time that any R.A.F. player has been sent off during a match.—C. M. MCA.

Golf.

The R.A.F. Officers' Golfing Association held their winter meeting at Wentworth on Mar. 8 :—

Sq. Ldr. C. H. Hayward won the Scratch prize with a score of 78, and, with his handicap of +2, tied for leading place in the First Division Handicap with Flt. Lt. Fawcus, 81 — 1 = 80, and Flt. Lt. Fullard, 90 — 10 = 80. In the Second Division there was a tie between Flg. Off. Sylvester, 92 — 16 = 76, and Air Vice-Marshal Longcroft, 88 — 12 = 76.

The prize for the best score over the first nine holes was won by Flt. Lt. Fullard, with 77, and Flt. Lt. Mylne had the best score for the last nine holes, with 36. In the first Division of the Bogey competition Sq. Ldr. Elliott was successful with a return of two up, Sq. Ldr. Hayward and Group Capt. Briggs being next with one up. In the Second Division there was a tie at three up among Flg. Off. Sylvester, Sq. Ldr. Breese, and Flt. Lt. Wann.

AIR AFFAIRS IN PARLIAMENT.

AIRSHIP MOORING MASTS.

In the House of Commons on Feb. 15, in reply to a question by COL. WOODCOCK, the UNDER-SECRETARY OF STATE FOR AIR said that His Majesty's Government in Canada had selected a site for a mooring mast base at St. Hubert, Montreal, and work was now in progress there. The head of the tower was being ordered by the Air Ministry on behalf of the Canadian Government and the rest of the structure and the equipment were being ordered in Canada. His Majesty's Government in the Union of South Africa had not yet decided which of four possible sites should be selected. They had asked the Air Ministry to order the whole of the equipment necessary and the masthead had already been ordered. A contract for the tower structure and machinery would be placed when the site had been selected.

R.A.F. MOTOR-CARS.

In the House of Commons on Feb. 15, in reply to questions by MAJOR G. DAVIES and BRIG.-GEN. CHARTERIS, the UNDER-SECRETARY OF STATE FOR AIR said that there had been no purchases of cars and
chassis of foreign make since last June, when a number of Fc
vehicles had been ordered, and he would like to make it quite cl
this had not been a case of the purchase of a foreign product becau
practically the whole of the manufacture and assembly had be
British. Improved types of vehicles had been under trial and h
proved satisfactory for the purposes for which Ford vehicles h
hitherto been required and it was expected that future orders wou
be for these improved types which were of British design as w
as manufacture.

THE DEATH OF MR. CHALMERS.

In the House of Commons on Feb. 15, in reply to a question
MR. W. BAKER, the SECRETARY OF STATE FOR AIR said that he was aw
of and deeply regretted the accident to a Gamecock machine
Feb. 8 which resulted in the death of Plt. Off. P. J. B. Chalme
He was unwilling to say anything which might prejudice the rep
of the Court of Inquiry which was being held, but he would po
out that his information was that although there were low clo
with slight mist and rain or drizzle at the time there was no th
fog and the ordinary flying of the unit was being carried out
the time. He would like to observe that although this officer h
only recently received his commission he had previously pass
through the normal two years' training course at the R.A.F. Ca
College which included instruction in practical flying and he w
a fully qualified pilot. He would repeat that all possible precautio
were taken to avoid accidents and due consideration was alwa
given to the weather and other conditions in which flying was carr
out.

RECRUITING IN THE R.A.F.

In the House of Commons on Feb. 14, in reply to a question
MR. LANSBURY, the SECRETARY OF STATE FOR AIR said that during
twelve months ending Dec. 31, 1927, 8,356 men had presented the
selves for recruitment in the R.A.F. Of these 2,453 had been accep
and 5,903 had been rejected. The number of boys who had sat
education tests during that period had been 2,171. Of these, 1,
had passed, 192 had been rejected on medical grounds, 253 had wi
drawn after examination and 1,030 had been attested. The ch
causes of rejection had been educational unfitness, unsuita
references and physical defects.

THE 'IRAQ—INDIA AIR SERVICE.

In the House of Commons on Feb. 13, in reply to a question
LT.-CDR. KENWORTHY, the SECRETARY OF STATE FOR FOREIGN AFFA
said that the attention of the Persian Government had on seve
recent occasions been drawn to the desirability of concluding
friendly settlement of the questions outstanding between our t
Governments of which one was the establishment of a civil air serv
between 'Iraq and India. Hitherto the attitude of the Persian Gove
ment had not permitted such a service to be operated, but nego
tions were still proceeding and he could make no further statem
on the subject at present.

AIR SURVEYS.

In the House of Commons on Feb. 27, in reply to a question
SIR R. THOMAS, the SECRETARY OF STATE FOR THE COLONIES said that
Government of Rhodesia was employing the Aircraft Operating
Ltd. in making an air survey of the Zambesi waterway in Barotsela
between Katombora and Barouale, including the Lungwo-Bunga ri
and the Kabompo river as far as the Lungu confluence. This Compa
was also supplying the Northern Rhodesia Government with m
made from aerial photographs of the highly mineralised area arou
N'changa, near the Northern Rhodesia—Congo boundary. In addit
the Company was making plans, from aerial surveys, of the to
ships of Livingstone, Lusaka and Broken Hill. He understood t
the Air Survey Co. Ltd. had recently completed a survey of
Rejang delta in Sarawak on behalf of the Government of that St
the total area surveyed being 1,800 square miles. This Company
also surveyed some 1,700 miles of territory for the British Mala
Petroleum Co. Ltd. in Sarawak and Brunei with the consent of
respective States. He also understood that the 'Iraq Government
recently concluded a contract with a British firm for an aerial sur
of certain lands in 'Iraq.

THE AKHWAN RAIDS.

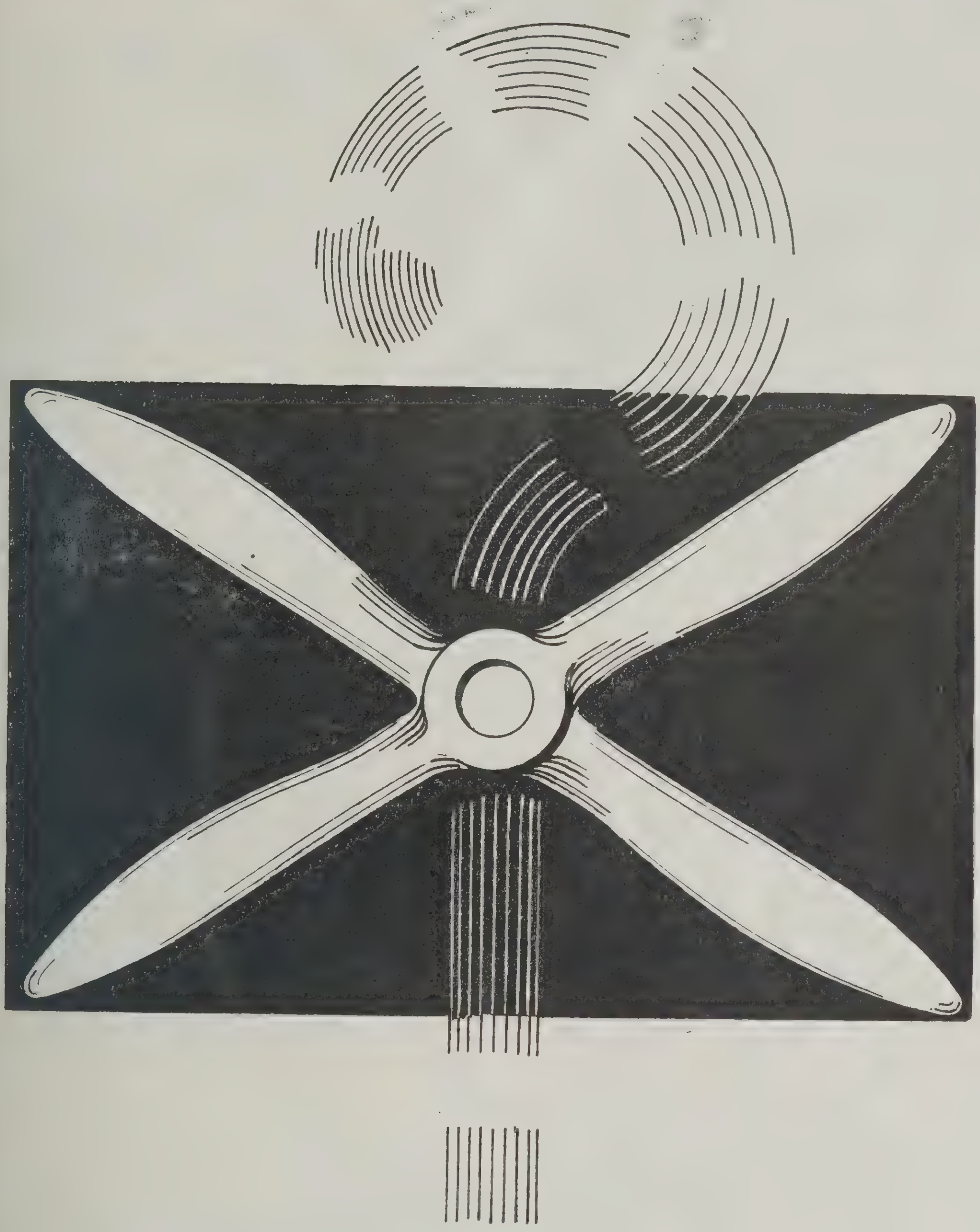
In the House of Commons on Mar. 5, in reply to a question
MR. DAY, the SECRETARY OF STATE FOR THE COLONIES said that
Majesty's Government had been most careful to furnish King
Saud with prior information as to the action to be taken to repel
raiders in 'Iraq. In reply to COL. WEDGWOOD, MR. AMERY said that
saw no reason for making an inquiry into the failure of the Brit
Air Force to prevent raids on the southern frontier of 'Iraq.
was quite satisfied that the Air Force had done, and was doing,
that was possible to deal with these raids, and that the maurauc
would ultimately learn that they could not penetrate peaceful nei
bouring territory and indulge with impunity in wanton pillage
the massacre of men, women and children. COL. WEDGWOOD as
MR. AMERY if he was quite satisfied that the H.Q. of the R.A.F. sho
remain in the northern part of 'Iraq while these raids generally t
place on the southern border and was he contemplating the shift
of the H.Q. so that the forces might be more on the spot. MR. AM
said that he was not contemplating interference with the discret
of the air commander there.

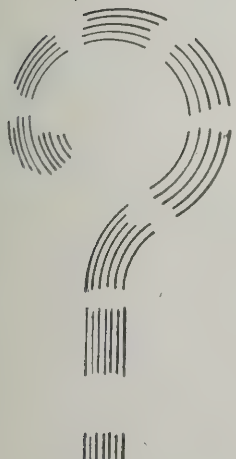
SHIPWRIGHTS IN AIRCRAFT CARRIERS.

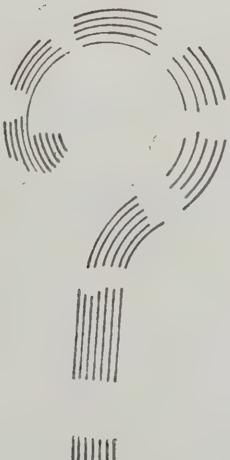
In the House of Commons on Mar. 7, in reply to a question
MR. HORE-BELISHA, the FIRST LORD OF THE ADMIRALTY said that
was not practicable at present to arrange for shipwright ratings
undergo a course of aircraft construction ashore as was done
certain shipwright officers. Arrangements were, however, in fo
for some of these ratings to undergo a somewhat similar course
instruction on board aircraft carriers as opportunity offered.

THE AIRSHIPS.

In the House of Commons on Mar. 7, in reply to a question
MR. ROSE, the SECRETARY OF STATE FOR AIR said that although provis
was not being made on Airships R.100 and R.101 for the transport
200 troops and their equipment, the airships would be capable
transporting that number of troops if the necessity should arise.







SIR ALAN COBHAM'S PROGRESS.

After spending two days at Beira, Portuguese East Africa, Sir Alan Cobham and his party, who are making a circuit of Africa on the Short Singapore (two Rolls-Royce Condor engines) left for Lourenco Marques, at 08.15 hrs. on Mar. 6. Lourenco Marques was reached without incident at 15.30 hrs., the whole distance of 550 miles being covered against a strong wind.

On Mar. 8 he left Lourenco Marques in the morning and reached Durban, Natal, soon after noon. A fairly extended stay is to be made at this port, during which the machine and engines will be given an overhaul, and in the meantime Sir Alan will discuss with the local interests the problems of developing commercial air services.

BRITISH AGENCIES IN AUSTRALIA.

According to *Aircraft* of Melbourne, Flt. Lt. L. C. Shoppee, D.S.C., A.M.I.Ae.E., R.A.F.O., of 125, Queen Street, Melbourne, has been appointed sole agent in Australia for Short Bros Ltd.

Robert Bryce and Co. (Pty) Ltd., of 482, Collins Street, Melbourne, has obtained the agency for the Bristol Jupiter engine in Australia.

AN OPPORTUNITY IN SWITZERLAND.

A communication from the British Legation at Berne reports with reference to a scheme for the promotion of civil aviation at Lausanne, that two biplanes fitted with dual control and equipped with an engine developing 80/100 h.p. will be required.

Firms in a position to offer British machines can obtain further particulars on application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W.1 (Reference AX. 5999).

THE ROYAL AERONAUTICAL SOCIETY.

The lecture by Dr. Rudorf on "The Testing of Material Used in Aircraft Construction," which was to have been given before the Royal Aeronautical Society with which is incorporated The Institution of Aeronautical Engineers on Thursday, Mar. 15, has unavoidably been postponed till a later date.

Instead, Flt. Lt. B. C. H. Cross, D.F.C., R.A.F., will give a lecture on the same day on "The Equipment and Maintenance of Flying Boats." The meeting will take place at 6.30 p.m. at the rooms of the Royal Society of Arts.

The annual general meeting of the Royal Aeronautical Society, with which is incorporated the Institution of Aeronautical Engineers, will be held on Tuesday, March 27, at 5.30 p.m. at the offices of the Society, 7, Albemarle Street, London, W.1.

MOTH NEWS.

During the past week the De Havilland Aircraft Co. Ltd. have received orders from the De Havilland Aircraft Proprietary Ltd., of Melbourne, Australia, for thirteen Moths. Eight of these are for use as training machines by the R.A.A.F., and the remaining five are for private users.

Mr. Henry Petre, one of the very early British pioneers of flying, has ordered a Moth for his own private use. will take delivery of this machine during the next days.

Three orders for Moths, all for the use of private ow have been received from Italy during the last few days.

According to *Aircraft*, of Melbourne, Mr. A. A. N Pentland, late Sq. Ldr. R.A.A.F., and recently flying structor to the Victorian Section of the Australian Club, has resigned from that position and has entered partnership with a Mr. Albert Royal to engage in air t port in connection with the development of the Sal goldfields in New Guinea.

For this purpose a Moth was bought from the De H land Aircraft Proprietary Ltd. and shipped to New Gu on Jan. 30, 1928. The machine is to be used for the t port of passengers and food for the mine workers bet Lae on the shores of the Huong Gulf (N.E. coast of Br New Guinea) and Wau, a landing ground in the gold- area, about 45 miles inland.

This is the second Moth in New Guinea, the first ha been purchased by the Morobe Trading Co. Ltd. of Ral by whom it is being used to carry general stores from company's base at Lae to a trading station at Edie Cre

LADY CARBERY.

On Mar. 12 Lady Carbery was killed at Nairobi, K Colony. She was giving dual control instruction to a Dudley Cowie when the machine went into a spin crashed on the aerodrome. Both the occupants were when taken from the wreckage.

Lady Carbery was the daughter of Mr. Alfred Ande of Nairobi. She learned to fly at the De Havilland Fl School in 1927 and before returning to Kenya she was g a D.H. Moth by her husband.

On Feb. 16 on her return to Kenya she flew from M basa to Nairobi with a passenger, and since then has her machine for flying about the country and giving senger flights.

Her keenness on flying, and her practical demonstr of the utility of the light aeroplane had given a great to the movement in Kenya. To her parents and to all have striven hard to further the cause of aviation in Africa, one offers one's sympathy.—L. B.

THE FLYING CLUBS.

The London Aeroplane Club.

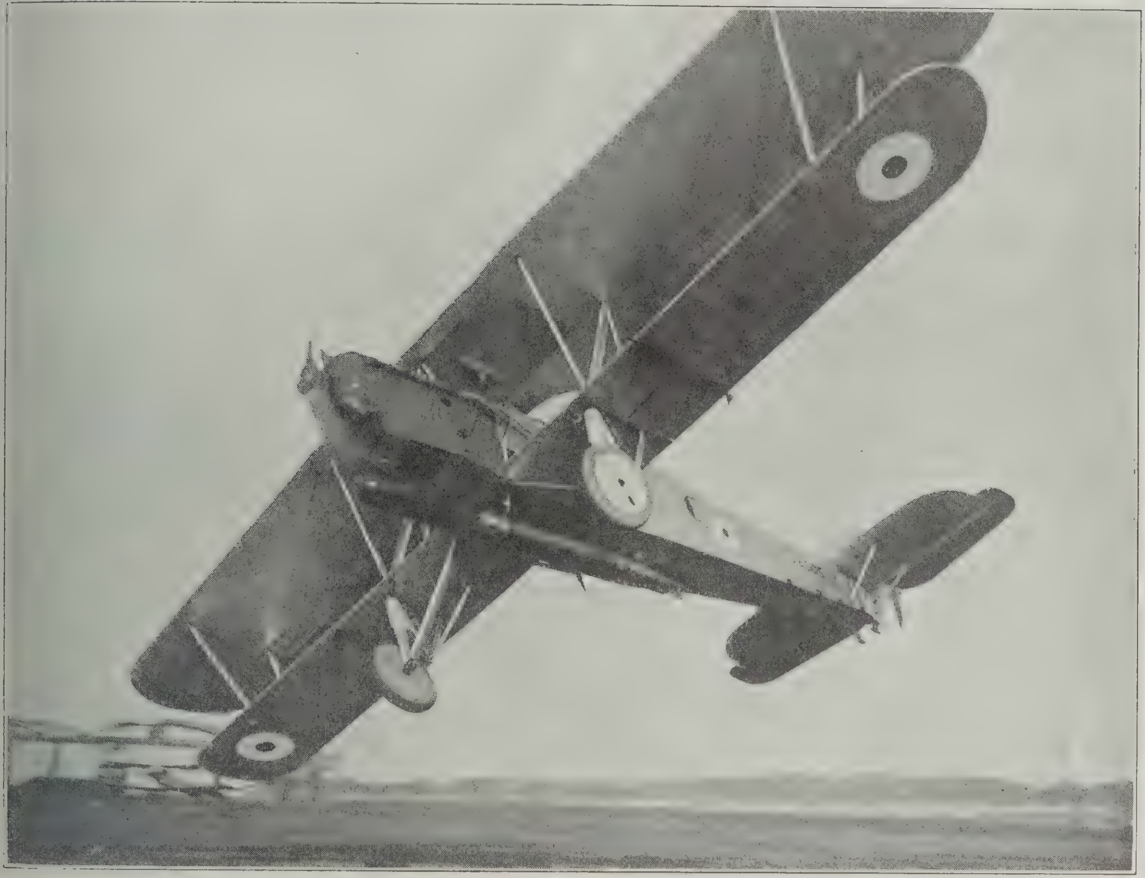
[Sec.: Harold E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Mar. 11.

Flying Time 28 hr. 30 min. *Instruction* 19 hr. 20 *min.* *So* 9 hr. 10 min. *Instruction.—With Mr. F. G. M. Sparks-* H. Cholmondeley, Miss O'Brien, Miss Fletcher, Messrs. G. A. Mines, A. Mason, W. H. Lane, D. S. Schreiber, P. A. Wills. *Mr. S. L. F. St. Barbe*—Miss V. Cholmondeley, Miss Wilson, M A. O. Wigzell, A. L. Petty, C. Peckham, J. A. Crane, J. A. Bre J. A. Murphy, W. H. Lane, H. Sutton, A. Mason, E. Davis. *Soloi* Miss O'Brien, Messrs. J. J. Hofer, R. Sanders Clark, C. E. Mu C. Paul, H. Solomon, W. Hay, B. B. Tucker, W. B. Michelmore, Wallace, W. L. M. O'Connor, H. M. Samuelson, G. H. Craig, Hall, J. A. Brewster. *Passenger Flights.—With Mr. Sparks-*

THE AVIAN SEAPLANE.—The first Avro Avian III seaplane (A.D.C. Cirrus II engine) alighting on Southampton Water at Hamble. The all-metal floats have been designed and built by A. V. Roe and Co. Ltd.

COASTAL DEFENCE



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Brewster, Miss Stewart, Mrs. Davis. *With Mr. G. H. Craig*—Mr. S. O. Bradshaw. *With Mr. Will Hay*—Master Hay.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Mar. 3.

Flying Time 21 hr. 45 min. *Instruction* 8 hr. 25 min. *Soloists* 6 hr. 55 min. *Passenger Flights* 5 hr. 25 min. *Tests* 1 hr. *Instruction.—With Mr. Baker*—Messrs. Cohen, Benson, Tweedale, Ellis, Weale, Stern, Brooking, Greenhalgh, Secker, Browning, Mills, Watson, Stross, Miss Emery and Miss Hill. *With Mr. Cantrill*—Messrs. Davison, Goss, Harber, Mangnall, Stern and Miss Baerlein. *With Mr. Scholes*—Messrs. Crosthwaite, Riley and Davison. *Soloists (under instruction)*.—Messrs. Hall, Cohen, Ruddy and Gerrard. *Pilots.*—Messrs. Meads, Caldecott, Browning, Lacayo, Michelson, Williams, Chapman, Twemlow, and Gattrell. *Passengers.—With Mr. Michelson*—Mr. Browning. *With Mr. Cantrill*—Mrs. Ruddy, Miss Fallon, Messrs. Faulkner, Wilkinson, Johanson, Wilson. *With Mr. Lacayo*—Messrs. Sievewright, Tasker, Mills and Caldecott. *With Mr. Meads*—Messrs. Benson and Hall. *With Mr. Twemlow*—Mrs. Twemlow, Miss Hulse, Messrs. Beard, Smith and Browning. *With Mr. Gatrell*—Mr. Thorpe. *With Mr. Baker*—Miss Loughlin, Messrs. Faulkner, J. Faulkner and Jordan. *With Mr. Scholes*—Miss Brodie, Messrs. Maddock, Hanley, Willing and Seddon.

Report for week ending Mar. 10.

Flying Time 37 hr. 30 min. *Instruction* 14 hr. 15 min. *Soloists* 11 hr. 40 min. *Passenger Flights* 10 hr. 5 min. *Tests* 1 hr. 30 min. *Instruction.—With Mr. Baker*—Messrs. Johnson, Hardy, Goss, Harrison, Weale, Harber, Brooking, Mills, Crosthwaite, Riley, Benson, Taylor, Parkes, Slack, Anderson, Watson, Greenhalgh, Secker, Allott, Gort, Cohen, Stern, Stross, and Pattrieoux. *With Mr. Cantrill*—Mr. Goss. *Soloists (under instruction)*.—Messrs. Cohen, Hall, Brooking, Gort, Gerrard and Ruddy. *Pilots.*—Messrs. Hardy, Gattrell, Twemlow, Lacayo, Crosthwaite, Chapman, Meads, Michelson, Nelson and Browning. *Passengers.—With Mr. Scholes*—Mrs. Bannister, Mrs. Slater, Miss Disley, Messrs. Nuttall, B. R. Goodfellow, D. R. Goodfellow, Melland, B. Melland, Slater and Disley. *With Mr. Williams*—Mrs. Moore, Miss Healey, Messrs Moore, Garner, Sievewright, Leach, Brimelow and Mills. *With Mr. Cantrill*—The Misses McDougall, Learoyd and Longton. *With Mr. Meads*—Mr. Benson. *With Mr. Lacayo*—Messrs. Shiers, Tooke, Sievewright and Mills. *With Mr. Twemlow*—Mrs. Twemlow and Mr. Allott. *With Mr. Gattrell*—Mr. Gilbert. *With Mr. Goodfellow*—Mr. Cantrill.

Despite intermittent fog at the beginning and frequent snowstorms at the end of the week over fifty members managed to get into the air. Mr. Brooking was launched on a successful first solo and Messrs. Gerrard and Gort accomplished their height tests. The latter, after being baffled by thick clouds at 5,000 ft. went up a second time and reached nearly 9,000 ft., so as to put the matter beyond doubt. Mr. Hall completed the tests for his "A" Licence.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Mar. 11.

Flying Time 8 hr. 15 min. *Instruction* 3 hr. 35 min. *Soloists* 25 min. *Tests* 40 min. *"A" Pilots* 3 hr. 35 min. *Instruction.—With Mr. Parkinson*—Miss Rambaut, Mr. Lloyd Brown, Mr. Runciman and Dr. Alderson. *Soloists (under instruction)*.—Dr. Alderson. *"A" Pilots.*—Mrs. Heslop, Miss Leathart, Messrs. D. Wilson, N. S. Todd, A. Bell.

The weather became increasingly bad from Monday throughout the week, ending in complete blanks on Saturday and Sunday, when a continuous blizzard prevented any flying.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Mar. 11.

Flying Time 17 hr. 55 min. *Instruction* 9 hr. 50 min. *Soloists* 7 hr. 5 min. *Passengers* 1 hr. *Instruction.—With Mr. Beck*—Messrs. Ambler, Brown, Clayton, Cooke, Jackson, R. K. Lax, T. Miller, Norway, Ostler, Senior, Shires, Ward, Watson, Yeomans. *Soloists.*—Messrs. D. Atcherley, Clapham, Lister. *"A" Pilots.*—Messrs. Dawson, Ellison, Norway, I. Thomson. *Passengers.—With Mr. Lister*—Mr. Shires. *With Mr. Thomson*—Messrs. Ellison and Ostler.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Mar. 11.

Flying Time 17 hr. 20 min. *Soloists* 2 hr. 25 min. *Dual* 11 hr. 40 min. *Passenger Flights* 2 hr. 25 min. *Tests* 50 min. *Instruction.—With Flt. Lt. Swoffer*—Mr. Powell, Miss Grace, Mr. Curtis-Nuthall, Lt. Richardson, Lt. Collier, Messrs. Rayson, Perfect, Wood, Gillett, Lt.-Cdr. Coveney, Messrs. Bull, Scott-Hall, Pearce, Westlake, Dickson, Courtney, Graham-Gibbs. *Soloists.*—Capt. Kirby, Rev. Fawkes, Mr. Perfect, Don J. de la Cierva, Mr. Rayson, Lt. Fagan, Lt. Oliver, Mr. Bowen, Mr. Parker. *Passengers.—With Flt. Lt. Swoffer*—Mrs. Ball, Miss Mott, Mrs. Graham-Gibbs, Messrs. Rosevear, Ball, Doxat, Kelly. *With Mr. Kirby*—Capt. Lovett, Mr. Morden, Mr. Mott.

Report for the month of February.

Flying Time 93 hr. 25 min. *Soloists* 46 hr. 55 min. *Dual* 30 hr. 55 min. *Passenger Flights* 13 hr. 5 min. *Tests* 2 hr. 30 min.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Mousehold, Norwich.]

Report for week ending Mar. 11

Flying Time 9 hr. 40 min. *Instruction.—With Mr. Fry*—Messrs. C. Cullum, W. H. Jewson, A. G. Barrett. *Soloists.*—Messrs. H. Mack, R. F. Potter, G. Surtees, C. Gowing and N. Brett.

All the flying this week has been done in the Moth as our G Engineer is cleaning up the engine of the Avro. Wintry cond prevail here now and the aerodrome is under snow.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Mar. 11.

Flying Time 4 hr. 50 min. *Instruction.—With Mr. Lowdell*- Georgia Rhodes, Miss D. Creasy, Messrs. K. Peck, H. Bill Soloists.—Dr. Jas. Sleigh, Messrs. H. Billinton, K. Peck, C. N. Pr

This has been rather an unfortunate week. On Tuesday summerlike weather prevailed the undercarriage of G-EBRE company with the fuselage and landed our overworked kite nose, breaking the prop, etc.

Don't forget the "ON TO HADLEIGH CUP" on Easter Sund

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Mar. 10.

Flying Time 25 hr. 30 min. *Instruction* 10 hr. 55 min. *S* 7 hr. 30 min. *Passenger Flights* 7 hr. 5 min. *Under Instruct* Major Hume, Messrs. Garnett, B. L. Bathurst, Roberts, G Stephens, Greenhill, Girdlestone, Kennan, H. C. H. Bathurst, W. Tanner. *Instruction.—With Mr. Holmes*—Mr. Stephens. *Wit Tratman*—Mr. Stephens. *Soloists.*—Messrs. Downes-Shaw, Bat Tratman, Hall, T. H. Clarke, Roberts, Arnold, O. P. Jones. *sengers.—With Mr. Hopper*—Mr. Roberts. *With Mr. Bathurst*- Stable, Lady Gwynne-Evans. *With Mr. Downes-Shaw*—Mr. Smi

The arrangements for our Pageant on May 5 are proceeding factorily. The three first machines in the first race will score in the Inter-Club Competition for the Society of British Aircraf structors' Challenge Cup.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending Mar. 11.

Flying Time 7 hr. 15 min. *Soloists* 3 hr. 15 min. *Dual* 4 h

The film, "With Cobham to the Cape," was shown at the House during the week-end and was much appreciated by the me present. Our membership is steadily increasing.

The Victoria (B.C.) Aero Club.

The Victoria Aero Club is at present taking steps to quali the Canadian Government's grant of two D.H. Moths, the con for which require that each club provides a suitable aero adequate housing facilities for the machines and a qualified pil ground engineer.

The Victoria Aero Club is negotiating with British Columbi ways Ltd. for the use of their new aerodrome, a portion of hangar and the services of their engineer. Providing satisf arrangements can be made, the club will undertake to build a house on the aerodrome.

The Hon. Secretary of the Victoria Aero Club is Mr. S Pickles, an Australian, who will be remembered as a very con performer on aeroplanes of various types at Hendon and else before the war. He learned to fly on a Bristol box-kite at lands, his certificate, numbered 263, being granted on July 30 After two active pre-war years of flying he joined the R.N.A 1914 as Flt. Sub-Lt. and was posted to the Isle of Grain. Ever he was invalided out of the service as the result of an old he received in a serious crash he had at Hendon in 1913 Champel biplane and took up civilian test flying. In 1919 he re to Australia and in 1920 he gave up active flying.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending Mar. 11.

Flying Time 66 hr. 50 min. *Instruction.—Dual* 15 hr. 15 min. 34 hr. 45 min. *Other Flying* 16 hr. 50 min.

Six new Moths were tested prior to delivery, and representati various foreign Governments were given demonstration flights the week.

On Friday, although the weather conditions were far from ide Hon. Lady Bailey set out on her lone flight to the Cape, panied, however, by the heartiest wishes of everyone for the s ful conclusion of a most sporting undertaking.

One R.A.F. Reserve *ab initio* pupil did a first solo, and two pupils are now ready for "A" Licence tests as soon as weathe ditions are favourable.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.

Report for week ending Mar. 8.

Flying Time 25 hr. 5 min. *Dual* 14 hr. 40 min. *Soloists* 25 min. *Dual.—With Mr. H. D. Davis*—Messrs. Glenny, Liniker, tree, Anderson, Hamilton, Jonassen, McCabe, Whittard, Dr. Wa Dr. Forcythe. *Soloists.*—Messrs. Crabtree, Anderson, McCabe, Liniker, Patton, Bethune, Glenny and Dr. Wall.

Despite the fact that it was impossible to fly for two days ow heavy rain storms, this has been the best week since the New

Mr. Anderson has now completed all his tests for his Licence and finished off by spinning AJ. In a competition among the pupils on the School "Bus," the height record present held by Mr. Anderson at 9,500 feet. Capt. A. E. Golds helping out instruction during the week-end rush. Mr. Lattey h qualified for his "A" Licence.

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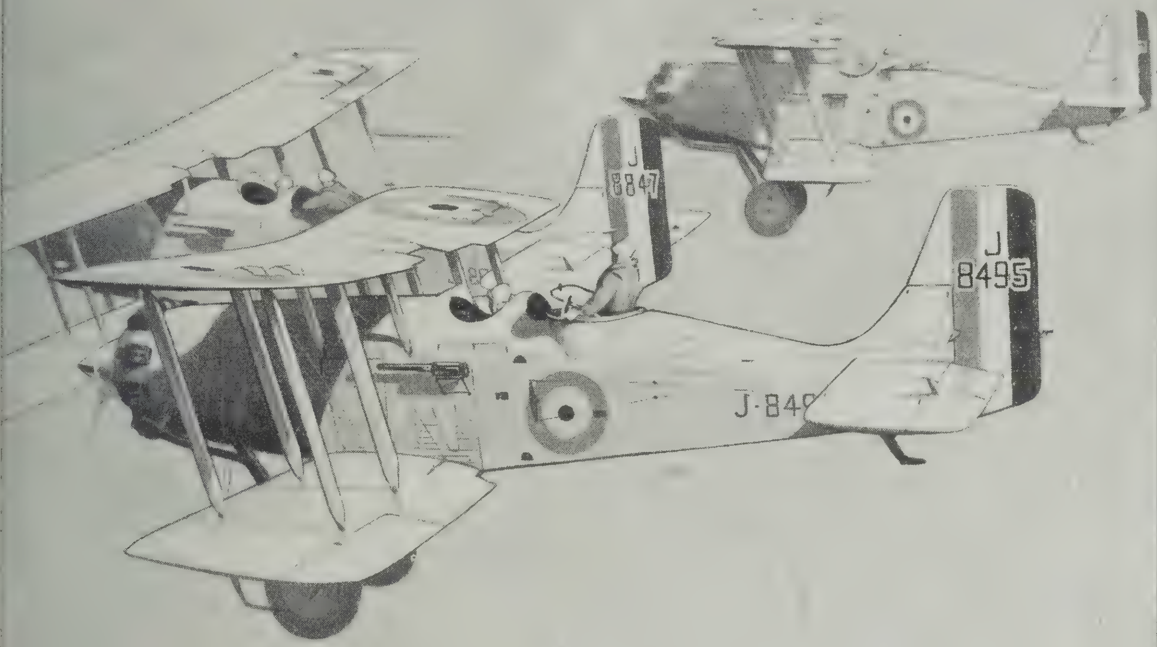

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THIS NEON HABIT.

[" This Airship Business." By E. F. Spanner, R.C.N.C. (retired), M.I.N.A., M.I.Mar.E., etc. London, Williams and Norgate, Ltd. Supplied by THE AEROPLANE Book Dept., 14, Bream's Buildings, E.C.4. 25s. net.]

The long list of engineering societies—not all of them recorded above—to which Mr. Spanner belongs seems to indicate that he possesses a large experience of engineering and some considerable technical qualifications. In this book, and in others, the author makes a vigorous protest against the squandering of public money on enterprises fundamentally unsound, at the instigation of people—official or otherwise—who are incompetent themselves to assess the technical difficulties of those enterprises and who are unready to listen to competent technical advice.

With any such protest in general the average technical man will sympathise very deeply.

In this particular book, Mr. Spanner in the *rôle* of " competent technical authority " explains at length why—in his opinion—the new airships R.100 and R.101 are doomed inevitably to disastrous failure. According to him, they have been designed in the face of all sound engineering knowledge and experience and their construction has been undertaken in a spirit of ignorant and exaggerated optimism.

The new airships may—or may not—prove to be failures. As an aeronautical engineer of many years' experience, but who has never specialised in airship design, one feels incompetent to form any very definite opinion on the subject. But having read both a large part of Mr. Spanner's book, and most of the technical literature from which he has drawn his information concerning airship development in the last few years, it may be said that Mr. Spanner's opinions do not carry conviction.

His many references to the " factors of safety " which he believes to have been adopted in the new ships, show clearly that he has not begun to understand the methods universally adopted for expressing the strength of aerial structures.

Some comments on the working of duralumin display a surprising ignorance of the qualities of a material which he unsparingly condemns, and his comments on recent researches into airship stressing, and his defence of the late Mr. C. I. R. Campbell, against a charge which has certainly not authentically been made against him, betray a similar lack of understanding of the subject.

" Crabbing " the enterprise of others—particularly when that enterprise calls for the solution of singularly difficult problems—is always easy. But it is not what one expects as from one engineer to another.—W. H. S.

MOTORING.

[" Ten Years of Motors and Motor Racing." By Charles Jarrott. Published by Radclyffe and Hutchings Ltd. 7s. 6d. net. On sale from THE AEROPLANE Book Department, 14, Bream's Buildings, E.C.4.]

Practically everybody who is interested in flying is also interested in motoring. And certainly everybody who is interested in motoring ought to read *Ten years of Motors and Motor Racing*, by Charles Jarrott, which tells the stories of the great Paris—Berlin, Paris—Vienna, Paris—Madrid, and other classic races on the open road, in which this well-known sportsman, at one time Lt.-Col., R.A.F., took part.

This book first appeared in 1906 when it was an up-to-date review of the previous ten years of motoring. It was published again in 1912 when it was very interesting to old timers but not exactly a genuine antique. To-day, twenty-two years after its first issue, it is not only intensely interesting history but is genuinely funny—especially the pic
of the speed-cars of the day and their drivers.

Nevertheless, when one reads of the deeds of those r
drivers and their mechanics,—how they rebuilt red-ho
gines by the roadside; how mechanics travelled at 60
m.p.h. for hours at a stretch, hanging onto the dash-
with one hand and pumping oil, or holding in a defe
clutch, with the other; and how drivers carried on a
speed through blinding clouds of dust when chasing
nearly as fast as their own—one realises that there
giants in the land in those days as great as the Seg
and Campbells of to-day.

The illustrations are remarkably good, even without a
ing for their having been reproduced from the prints i
first issue. And altogether the book is as good value as
thing one has met at the price.—C. G. G.

AN OPINION WORTH HAVING.

Among the strictly technical aeronautical journals o
World none surpasses in soundness and accuracy the
French publication *L'Aeronautique*, so ably directed b
Henri Bouché. Therefore the opinion of that journal o
the World's Aircraft is well worth considering. Its r
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Liverpool Civic Week Cup - -	S.E.5A.
Rodman Cup - Airdisco	S.E.5.
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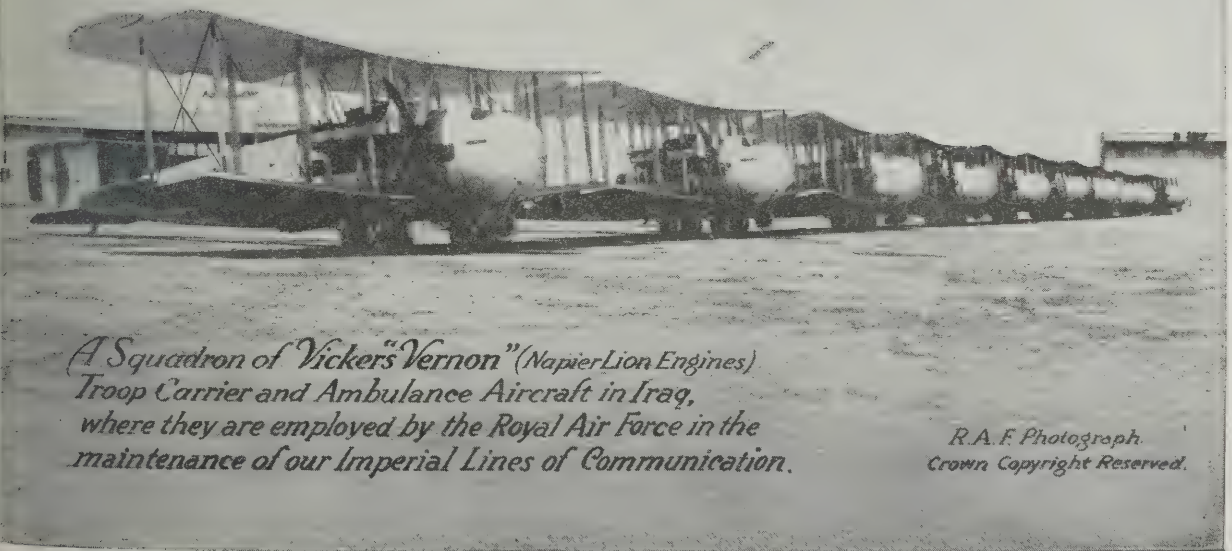

A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph.
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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Monday, 16; Tuesday, 13; Wednesday, 16; Thursday, 22; Friday, 20; Saturday, 16.

IMPERIAL AIRWAYS LTD. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne : Machines 43, passengers 313, freight 16 tons.

AIR UNION :
Paris—London : Machines 25, passengers 70, freight 12½ tons.

K.L.M. :
Amsterdam—Rotterdam—London : Machines 13, passengers 35, freight 4½ tons.

SABENA :
Brussels—London : Machines 10, passengers 13, freight 1 ton.

DEUTSCHE LUFTHANSA AG. :
Amsterdam—London : Machines 11, passengers 24.

PRIVATE :
Machines 1, passengers 0.

Total number of trips by British Machines, 44, carrying 313 passengers. Foreign Machines, 59, carrying 142 passengers.

COMPARATIVE FIGURES.

Six days ending Mar. 10 :
Machines, 103; Passengers, 455; Crews, 202; Total personnel, 657.

Corresponding week, 1927 :
Machines, 70; Passengers, 291; Crews, 116; Total personnel, 407.

Corresponding week, 1926 :
Machines, 78; Passengers, 197; Crews, 90; Total personnel, 287.

Corresponding week, 1925 :
Machines, 35; Passengers, 120; Crews, 67; Total personnel, 193.

Corresponding week, 1924 :
Machines, 114; Passengers, 259; Crews, 194; Total personnel, 453.

Corresponding week, 1923 :
Machines, 67; Passengers, 207; Crews, 126; Total personnel, 333.

Corresponding week, 1922 :
Machines, 53; Passengers, 113; Crews, 88; Total personnel, 201.

Corresponding week, 1921 :
Machines, 35; Passengers, 92; Crews, 43; Total personnel, 135.

Note.—Returns for the current week cover six days only in order that for the future traffic returns may be made up for a week ending on Saturday.

Croydon Notes.

With the complete lack of ostentation so characteristic of her, the Hon. Lady Bailey left Croydon on Friday, Mar. 9, at 13.30 hours on her way to South Africa. None at Croydon seems to have been aware of her impending departure and most of those who would otherwise have turned out to wish her God-speed were at lunch. Unfortunately Lady Bailey ran into fog on the other side of the Channel and did
get through to Paris until Saturday.

Apropos certain remarks made in this column in the i
of Jan. 25, 1928, as to certain difficulties which the K.L
had experienced with Gnôme-Rhône Jupiter engines of
Series VI, the Technical Department of the K.L.M., i
letter recently addressed to THE AEROPLANE, state that
though they had a certain amount of difficulty with
type of engine at the end of the Summer season of
the French manufacturers have now overcome the trou
by improving certain details.

Tests having shown that these engines are now
satisfactory, an order has been placed with the Gnôme-Rh
firm for Jupiter VI engines for the new twin-engined Fo
F8 machines, and the officials of the K.L.M. are convi
that the Jupiter VI as now made in France is a very ma
improvement on the Jupiter IV.

A little incident which occurred during the spell of
weather a fortnight ago seems to show that the air-travel
public really has taken to heart the propaganda in fa
of three-engined machines.

On the day in question no Argosy was available for
mid-day Silver-Wing service, and a Handley Page W.10
two Napier Lion engines, was substituted. There were
ever more passengers than the W.10 could carry, and
Hamilton (W.8F) with one Rolls-Royce Eagle and
Siddeley Puma engines was put on to take the overflow.

At the hour appointed for the start the pilot of the
discovered that two of his passengers were missing.
much hunting they were found in the Hamilton, where
constituted an overload. They were very indignant at
removed from the Hamilton on the ground that they
paid Silver Wing fares to travel in a three-engined mac
and it took quite a long time to persuade them to em
in the W.10.

THE CHANNEL CRASH.

One of the Farman Goliaths F-AEFC, on the Air Un
London-Paris service, was lost in the English Channe
Sunday, Mar. 11, at a little after 11.30 hours. The pilot
Schmutz, and the mechanic, M. Cerade, were both kill

This machine, with three passengers, left Le Bourge
Saturday afternoon, but was forced by weather to lan
St. Inglevert, where it remained for the night, the pa
gers proceeding by road to Calais and completing
journey by boat and train.

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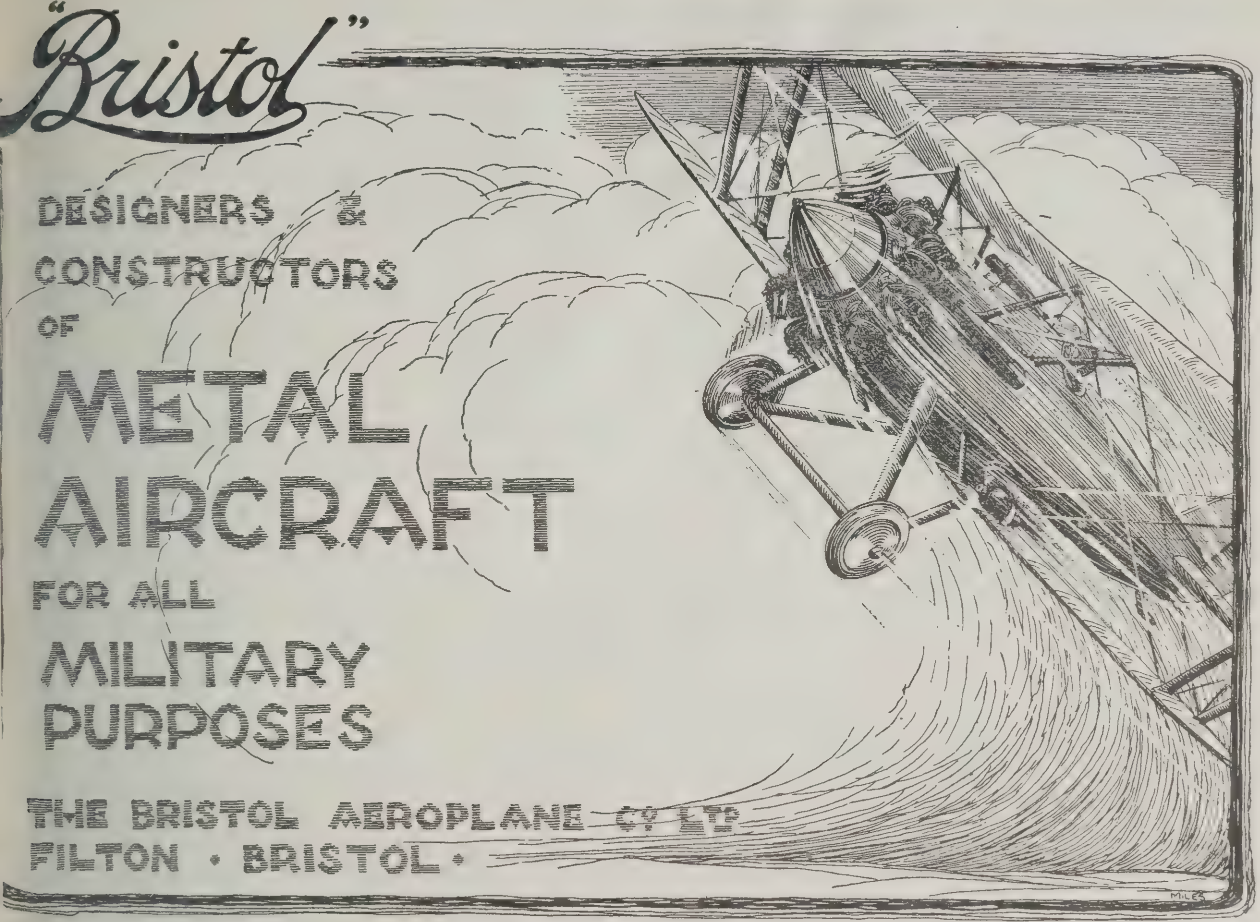
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BUNDABERG 29-2-28

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& CO., LTD.,
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LONDON, E.C.2.

In spite of continued bad weather on Sunday morning M. Schmutz decided to continue his journey to Croydon, and left St. Inglevert at 11.30 hours. He ran into a very severe snowstorm almost at once, and at 11.37 hours Croydon Aerodrome received a distress signal stating that he was descending into the Channel.

The Southern Railway Co.'s s.s. *Maid of Orleans,* which left Boulogne at about the time of the accident, was notified by wireless, and shortly afterwards sighted the wreck. A boat from her picked up the bodies of her crew and salved some floating portions of the machine's freight.

The machine itself is reported to have been a complete wreck.

M. Schmutz, who served with distinction in the French Air Service during the War, and afterwards in Indo-China, had been flying on the London-Paris service since August last.

At the inquest, which was held at Folkestone on Monday, Mar. 13, no evidence throwing any light on the accident was given, and a verdict of "Found dead in the sea amidst wreckage of aircraft, the said aircraft having descended in the sea during a snowstorm," was recorded by the Coroner.

EASTER AIR EXCURSIONS TO PARIS.

Air Union announce that between Monday, Apr. 2, and Monday, Apr. 16 inclusive, special excursion tickets to Paris at the reduced return fare of £6 6s. The single fare will be at the ordinary rate of £3 15s. Thirty lbs. of free luggage will be allowed per passenger, and excess luggage will be charged at 3d. per lb.

Passengers will leave the offices of Air Union, 32, Haymarket, at 6.0 a.m. and 11.15 a.m. daily, will depart from Croydon one hour later, and are due to arrive at the Grand Hotel, Paris, at 10.30 a.m. and 4.0 p.m. respectively. The return journeys start from the Grand Hotel, Paris, at 11.30 a.m. and 2.00 p.m., leave Le Bourget one hour later and passengers should arrive at 32, Haymarket, at 4.0 p.m. and 6.30 p.m.

AIR MAILS TO INDIA.

Apropos the statement in Sir Samuel Hoare's speech introducing the Air Estimates in the House, concerning the new agreement which is to be concluded between the Air Ministry and Imperial Airways for the inauguration of a weekly Air Mail service between England and India, *The Times* p
lishes a statement made by an official of Imperial Airwa

This statement is quite definite that the proposed
route right through from London to Delhi is to be opera
in the relatively near future, and that without night fly
it will be possible to shorten the time for the delivery
letters from London to Delhi to nine days, which will la
be reduced to seven. The proposed surcharge for letters
this route will probably be between 6d. and 9d. per lette

In answer to further inquiries Imperial Airways s
that in the present state of the negotiations they are
able to state how and by what route this service is to
effected.

THE DUTCH EAST INDIES SERVICE.

Mr. Plesman, manager of the K.L.M., has just returne
Holland after a trip round the World. The main objec
his journey was to pay a visit to the Dutch East In
for the purpose of making definite arrangements for
establishment of an air mail and passenger service in th
islands. But having completed this business he procee
via Singapore to Japan, thence to San Francisco, and ac
the United States, and so home via New York, Cherbo
and Paris.

According to an interview with Mr. Plesman in Paris, p
lished in *Aerauto* for Mar. 10, the service in the Du
Indies will be opened about September, 1928, and will
sist of a daily service each way between Batavia
Bandoeng, and between Batavia, Semerang and Sourab
By air the trip from Batavia to Sourabaya will take
hours as against thirty-one hours by train. Passenger f
by air will be only 50% greater than the first-class
fare.

A new company, closely allied to the K.L.M., and ha
Mr. Plesman as one of its directors, has been formed
operate this service. Capital to the extent of 5,00
florins (£400,000) has been subscribed in part by the D
shipping companies, and the Dutch Colonial Governn
has agreed to grant an annual subsidy of 1,000,000 flo
(£80,000) for a period of five years.

To start the service four Fokker F.VII-3m mach
(three Armstrong-Siddeley Lynx engines) have been orde
These will fly out to Batavia towards the end of the sum
of 1928.

Extract from "Morning Post," 29-2-28.

FORMATION FLIGHT

CRUISE COMPARABLE TO THAT OF SEA-GOING SHIPS.

The Four Royal Air Force Supermarine Napier Southampton Flying Boats which have arrived at Singapore have completed th
longest formation flight on record. This air cruise is comparable with the cruises carried out by warships. The aircraft hav
maintained station over the whole distance. It is the first extensive overseas air cruise ever attempted, it indicates in a strikin
manner the wonderful scope of large metal flying boats. It is understood that Group Captain Cave-Browne-Cave is completel
satisfied with the result of the flight.

The machines are in excellent condition, their metal hulls standing the strain well. Numerous incidents on the voyag
indicate that these modern metal flying boats are self-contained.

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Eventually it is intended to run a regular air mail service between Holland and Batavia. To this end it is hoped that during 1929 twelve return trips over the whole route may be made.

In the same interview Mr. Plesman expressed his admiration for the American Air Mail service as he had been able to observe it during his trip. He expressed the opinion that America was far in advance of Europe because firstly the Americans understood the art of propaganda, and secondly because they were not afflicted by a large number of incompetent Post Office organisations, any one of which could put difficulties in the way of an adequate European air mail system.

NEW COMPANY.

Aeromarine Ltd.—Private company, Registered Mar. 5, Capital, £2,000 in £1 shares. To carry on the business of boat and yacht builders, marine motor and engine manufacturers, makers of and dealers in aeroplanes, biplanes, waterplanes, and all kinds of aircraft, carriers of passengers and goods, etc. The subscribers (each with one share) are: P. R. Bordewich, Wivenhoe, Essex, engineer. F. R. Robinson, 3/4, Clements Inn, W.C.2, solicitor. The first directors are Capt. J. S. Coats, M.C., Balmains, Stanley, Perthshire; and P. R. Bordewich, jnr., The Shipyard, Littlehampton. Qualification: £1. Remuneration: As fixed by the company. Solicitors: Vivash Robinson and Co., 34, Clements Inn, W.C.2. Registered office: Wivenhoe, Essex.

PERSONAL NOTICES.

Deaths.

HOILE.—On Mar. 8, at Fairlight, Burgess Hill, from a wound received in the War, Flt. Lt. William Henry Hoile, M.B.E., beloved husband of Hilda Hoile, aged 41.

KINKEAD.—On Mar. 12, in the Solent, as the result of a flying accident, Flt. Lt. S. M. Kinkead, D.S.O., D.S.C., D.F.C., R.A.F.

Flt. Lt. Kinkead was born in South Africa and educated at the High School, Johannesburg, and the Marist College. He joined the R.N.A.S. in September, 1915, and served in the Dardanelles and the Dunkirk Area. He was awarded the Distinguished Service Cross in 1917 "in recognition of the conspicuous gallantry and skill displayed by him in the face of the enemy in aerial combats." In 1918 he was awarded a bar to the D.S.C. "for the skill and courage displayed by him as a pilot, etc." In July, 1918, he was awarded the Distinguished Flying Cross "in recognition of acts of gallantry and distinguished service"; and in November, 1918, he was awarded a bar to the Distinguished Flying Cross for engaging a large party of troops wood and dispersing them while being harassed by six hostile sc

After the Armistice he went to South Russia with No. 47 Squa For his services in South Russia Flt. Lt. Kinkead was made a panion of the Distinguished Service Order. He was also awarde Russian Order of St. Anne, 2nd class, the Cross of St. George class, and the Order of St. Vladimir, 4th class, with swords.

The *London Gazette* of Apr. 1, 1920, notifying his appointment a Companion of the Distinguished Service Order states: "On Oc 1919, near Kotluban, this officer led a formation of Camel mac and attacked the cavalry division of Dumenko. By skilful tacti low flying he dispersed this force which had turned the left of the Caucasian Army and threatened to jeopardise the whole de of Tsaritsyn. Flg. Off. Kinkead has carried out similar attack enemy troops, batteries, camps, and transport with great success at considerable personal risk."

After his return from South Russia he was posted to the Fl Wing of the R.A.F. Cadet College at Cranwell. From there he to No. 24 Squadron at Kenley for a course of instruction an Jan. 31, 1922, he was posted to No. 30 (Bombing) Squadron at Hi 'Iraq. While in 'Iraq he played polo for his Squadron, who wer runners-up for the 'Iraq Command Polo Cup in 1922. In the spri 1925 he was posted to H.Q., Middle East, while he was engaged o ground organisation of the Northern section of the 1925 Cairo— Town flight by the R.A.F. He was restored to the Home Estal ment at the end of 1926 and in January, 1927, he was posted to Flying Training School as an Instructor. In June, 1927, he was p to the Marine Aircraft Experimental Establishment at Felixstow duty with the High Speed Flight.

KIRKER.—On Feb. 28, at Hinaidi, 'Iraq, Flt. Lt. James A. Ki B.A., B.A.I., Assistant Engineer (Works and Buildings Staff), onl of the late S. K. Kirker and Mrs. Kirker, Tullyhunco, Abingdon, B

Forthcoming Marriages.

BARR-SIM—KEMP.—The engagement is announced between Sq. A. E. Barr-Sim, M.B., Ch.B., R.A.F., and Peggie, widow of Flt Walter Kemp, of 26, Cheriton Place, Folkestone, daughter of the Colonel E. B. Snow and of Mrs. E. B. Snow.

KNOLLYS—COATS.—The engagement is announced of the Vis Knollys, D.F.C., and Miss Margaret Coats, daughter of Sir Stuart Lady Coats, of Ballathie, Perthshire.

PHILLIPS—CROFT.—The engagement is announced between Off. J. S. Phillips, R.A.F., elder son of the Rev. P. R. Phillips Mrs. Phillips, of Hildersham Rectory, Cambridge, and Miss Croft, of Meadham, Harlow, Essex, third daughter of the late Archer Croft, Bt., of Croft Castle, Herefordshire.

Births.

LOTHERINGTON.—On Mar. 8, at Green Man Hotel, Ewell, to of H. A. Lotherington, Flg. Off., R.A.F.O.—a daughter.

ROBERTS.—On Mar. 6, at 121, The Drive, Wellingborough, North to Dorothy, wife of Flg. Off. C. H. Roberts, R.A.F.—a daughter.

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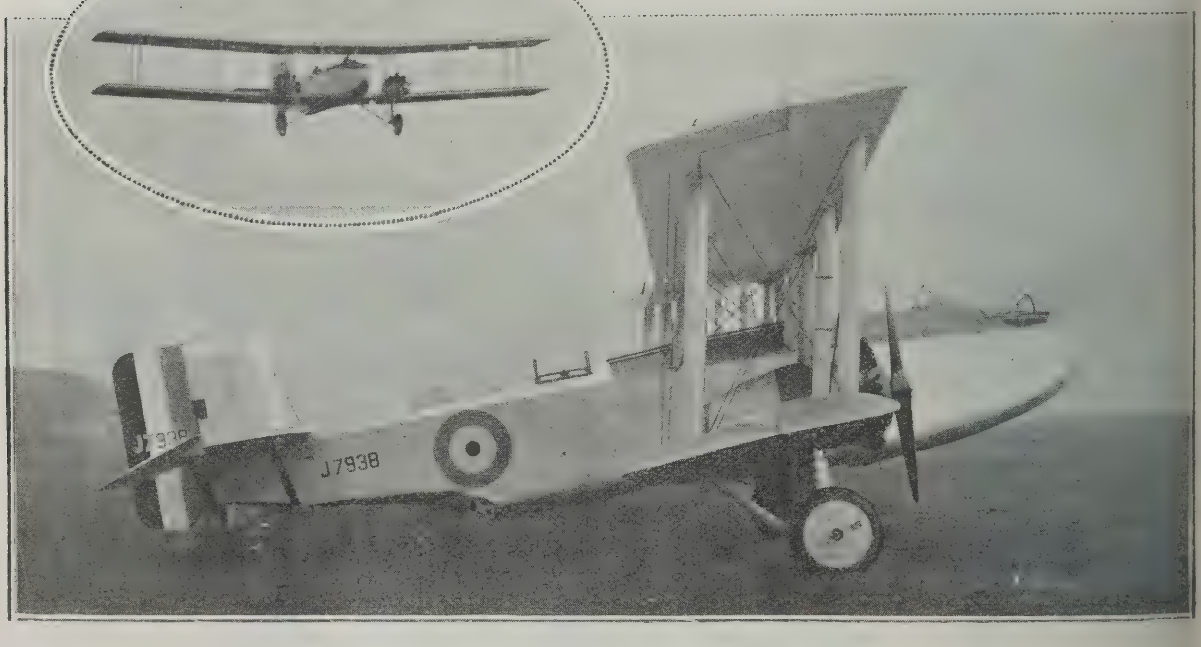

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Eng'ng

THE AEROPLANE—MARCH 21, 1928.

THE AIR DEBATE.

THE AEROPLANE

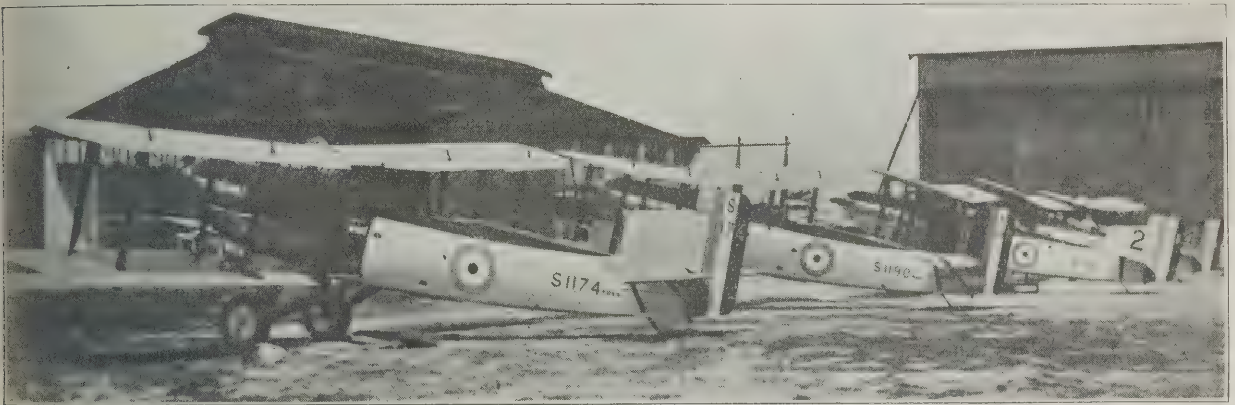
INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 12. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"ONCE MORE, ADIEU, BE VALIANT AND SPEED WELL."

(SHAKSPEARE—*Richard III.*)



THE THIRD ANNUAL CAPE FLIGHT:—The four Fairey III.F biplanes (450 h.p. Napier Lion engines) of the 1928 Cairo—Cape Town—Cairo Flight at Aboukir on the outward journey. The Flight is commanded by Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., R.A.F.

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4. LONGEST SOLO FLIGHT ever made.
5. FASTEST TIME—ENGLAND TO INDIA.
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MAR. 21, 1928.

THE AEROPLANE
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VOL. XXXIV. No. 12.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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THE AIR DEBATE.

The Debate on the Air Estimates took place on March 12. onourable Members were if anything a trifle less verbose an usual. Including Sir Samuel Hoare's statement they ly spoke 130 columns of Hansard, but as that amount ould be enough to fill a couple of issues of THE AEROPLANE e has condensed it to essentials in the following report. ere and there a striking phrase or a statement of some w fact is reproduced in full. Editorial comments and icidations appear between brackets.

SIR SAMUEL HOARE in his introductory statement pointed t that the Air Vote now absorbed the air expenditure ich had hitherto been carried by the Colonial Office, and s pleased to say that in spite of this increase of about ,000,000 the total amount was only £700,000 more than it d been in 1927, and he explained that the total amount ich was being spent on air services from all sources was 50,000 less than in the previous year. He announced that spite of this the Air Force would have been strengthened the equivalent of four squadrons, and that no less than % of the squadrons would have been armed with new e machines at the end of the year. [Presumably Sir muel means that 70% of the squadrons will have machines types which were not actually used in the War ten years . There seems little cause for congratulation in that.]

He said that this result had only been reached with drastic s and with the sacrifice of many items which his advisors d he would have wished to include in the Estimates.

ealing with airships, Sir Samuel announced that the two w airships would be flying within the ensuing twelve nths. He believed that the aeroplane would be invaluable short distances, but that the airship, if it could be ved safe and dependable, would have a range of several usand miles, and need not land on foreign territory, ides being able to use trade and other favourable winds passing from one part of the Empire to another. The airships could have been built in little more than a r, but three years had been devoted to experiment and earch.

OMMANDER BELLAIRS interposed the remark that the Air nistry was opposed to airships up to about four years ago.

IR SAMUEL HOARE replied, "That only shows how much er they are than they were." [He might have added t until four years ago there was no money available for ships.]

OUR IMPERIAL AIR LINE.

n the subject of commercial air lines Sir Samuel said t further subsidies were possible for Civil Aviation owing the completion of certain stages of the building pro-mme. [He did not make it clear whether he referred to k and stone buildings or to the building of new aircraft.]

e hoped that this year a weekly air mail service to India ld be possible and that letters would go from London Delhi in seven days and from London to Calcutta in nine rs. This estimate was the result of experience with perial Airways Ltd.

wo more lessons had been learned, the first was that line policy should be mainly Imperial and not European, secondly, that if Civil Aviation was to become self-porting the company must be able to substitute new es for old at comparatively short intervals. When Impe- Airways started operations running costs were 4s. 2d. ton-mile, whereas the new types were operating at only 10d. per ton-mile, with the result that the new types e covering their prime costs of operation as distinct from ding charges. It seemed clear that with further nges we might look forward to a time when Civil Avia- would be self-supporting and not subsidised at all.

he Air Ministry had decided to substitute a new agree- nt for the old, based on three principles:—Firstly, a kly mail service to India; secondly, a regular substitu- of new types for old; and thirdly, the right of the e to share in any ultimate prosperity which the com- y might achieve.

s to the objection of the Persian Government to our machines flying over the Persian section of the route, he said that he could not help thinking that there must be some misunderstanding, because the air route must manifestly be to the advantage of Persia. Unlike other foreign countries, we were not asking them for any subsidy, we were offering them for nothing an air route over inaccessible parts of their country and providing them with landing grounds and aerodrome facilities. At one time these advantages seemed to appeal to the Persians, for they actually signed an agreement with us, and their officials helped us to mark out the route.

[One is under the impression that the Persian objection is entirely the result of what can only be called "foreign intrigues." Possibly the Union of Socialist Soviet Republics may be to blame. But there is always a possibility that our friends and rivals in Germany may have influenced Persian Government officials to stop our machines from flying over Persia as a retaliation for our having induced the 'Iraqi Government to stop Junkers machines from flying to Baghdad from Persia.

Though one hears nothing about it, Junkers machines habitually fly from Bushire and Bundar Abbas to Mohammerah, which is Persian territory, although it is leased by the Anglo-Persian Oil Company. That is as near 'Iraq as the Persian Junkers machines are allowed. Presumably, our objection to an air line from Persia to Baghdad or even Basrah is that we wish to stop Soviet agents from penetrating into 'Iraq and causing trouble. But one imagines that if they wanted to do so there are plenty of ways of getting into 'Iraq which are much more difficult for us to watch than the terminus of an air line would be. Therefore one hopes that we shall soon be able to come to a friendly agreement with Persia.]

Further Sir Samuel said that the possibilities of alternative routes were being investigated. [meaning, presumably, flying-boats down the Arabian side of the Persian Gulf by way of Bahrein Island.] He said that if we could only get the London—Delhi service into operation it would in time be so attractive to business men that we should receive a substantial increase in revenue.

LT.-CDR. KENWORTHY asked whether we were negotiating with the Dutch to extend the route to Australia.

SIR SAMUEL HOARE said that we were not negotiating with them, but we had had some very friendly talks with them and that when once we had got to India we hoped to pass on to the Dutch East Indies and Australia.

THE MILITANT SIDE.

Passing to the military side of aviation Sir Samuel referred to the increase of the Air Force by 4 squadrons, to the development of flying-boats, to the saving on spare parts owing to the increased reliability of new type machines, to the seaplane experimental tank, and the variable density wind tunnel, which were discussed at some length in this paper last week.

He then recalled that the Air Force had been in existence almost exactly ten years and asked Members whether after this experience the decision to create a separate Air Force had been justified? He pointed out that the R.A.F. was created as an independent organisation not because of the claims of theorists but as the result of a definite demand from public opinion, to avoid duplication, and to ensure unity of command and effort.

In justifying the Air Force he stated that since 1922 the number of squadrons had been more than doubled and yet the number of personnel had only been increased by one-fifth.

In 1922 we were spending only £2,000,000 on Technical Equipment but this year we were spending nearly £6,000,000 on machines and engines, and yet the total Air Vote had only increased 22%. Our expenditure on garrisons in the Middle East was then £27,000,000 per annum, but since the Air Force took over the responsibility this had been reduced to only £2,000,000.

During its ten years the Air Force had never failed to do the duties with which it had been faced. The Air Force now offered a stable career for officers and men. It had its risks like any other profession, but last year was the best it had ever had as regards accidents in proportion to flying hours.

New safety devices were being introduced. More than one fatal accident had been avoided during the last twelve months by the use of parachutes. And much was hoped from the slotted wing, an invention of which Mr. Handley Page and those who worked with him might be justly proud.

After remarking on the good work being done by the University, Auxiliary and Cadre squadrons Sir Samuel said that the Air Ministry wished to interest the great towns and the great industries, particularly the metal industries, in the progress of the Air Force, and just as, in the past, certain regiments had been connected with certain Service families or with certain counties, so they wished to connect these new Air Force units with the great industries and the great centres of population.

Remarking that about 150 comparatively young officers with Short Service Commissions left the Air Force every year, he said that the Air Ministry were doing everything in their power to get suitable appointments for them. And he stated that a full-time official would be appointed whose duty it would be, acting on the lines of the Appointments Boards at Universities, to bring these young men as they left the Force into touch with employers who would give them appointments. Although this new organisation had only been in existence for a few weeks appointments had been found for quite a number of these young men.

In conclusion Sir Samuel referred to the winning of the Schneider Trophy, the success of the Far East Flight, the development of all-metal flying-boats, the use of stainless steel in metal machines and the vast improvement in the efficiency of both air-cooled and water-cooled engines.

A Tribute.

He concluded his speech as follows :—

"I think I may be pardoned in my last sentence or two for making an observation that I would not make upon any ordinary occasion. This is the end of the first ten years of the life of the Air Ministry. I know how sensitive, and how rightly sensitive, the House is as to the introduction of the name of any permanent official or any serving officer in the Debates of this House, but upon this occasion I feel that I must make a passing reference to the man, who, during the whole of these ten years, has watched over the life of the Air Force and to whose sound judgment and resolute purpose so much of this success is due.

"There has never been a fighting service so closely identified with its chief as has the Air Force during the ten years it has been identified with Sir Hugh Trenchard. To-day I do not mention his name in order to bring it into the field of parliamentary controversy. I mention it solely with this object that if in the course of this Debate hon. Members think that we have made not unsatisfactory progress, they should give credit to whom credit is due, and they should remember the sound judgment and the resolute purpose without which the progress that I have just described would have been impossible in the first ten years of the life of this new service."

THE DEBATE.

Mr. H. Dalton (Peckham, Labour) referred to the fact already raised by Lt.-Cdr. Kenworthy in a question, that certain newspapers published particulars about the Air Estimates on the Thursday morning, although the Estimates themselves were not available for Members at that time [the Estimates were not published till Friday], and suggested that Sir Samuel Hoare was a little touchy in replying that in every year there was some degree of similar intelligent anticipation in the case of the Estimates and that there was no question of departmental leakage. Mr. Dalton very properly expressed regret and some concern that information contained in these Estimates should not be available to Members of the House before it was made available to daily newspapers. He hoped that stricter control would be kept to check the garrulity of persons who should hold their peace for a few hours longer. [Readers of this paper will remember that one complained last week of the inadequate time given for consideration of the Estimates.]

Continuing, Mr. Dalton referred to the regularity of the day and night aeroplane services between New York and San Francisco and suggested that we ought to be able to achieve equal regularity. He mentioned rumours that the staff of Imperial Airways at Croydon was on a somewhat large scale and wanted to be assured that the subsidy was not being frittered away on unnecessary and grandiose details. [One imagines that Mr. Dalton has heard about the Great Airport of Croydon and must have confused it with the internal organisation of Imperial Airways.]

Referring to expenditure in the Services he remarked " I has been said that the Army do themselves moderately well that the Navy do themselves very well, and that the Ai Ministry do themselves very well indeed," and said that th economy of this year, being due to the slowing down o the expansion, obviously meant increases in the future Apropos the six 'Iraqi cadets at Cranwell, he hoped that the were an indication that the time was not very far away whe 'Iraq would undertake its own defence at its own expens and that the flying would be done by natives of 'Iraq [Perhaps, twenty years' hence when these first six cadet have had enough experience to become General Officers an have themselves trained a few hundreds of other 'Iraqis t fly.]

He also asked how soon and how fast Cranwell coul absorb cadets from India. [The question should have been,— How soon and how fast native Indians will be willing an able to learn to fly?]

Further, Mr. Dalton lamented that the drive and determination which had been put behind achievements in ai communications had not been applied to the coal-fields an other basic industries. [The explanation simply is that th minds of those connected with aeronautics has not yet become clogged by decades of affluence.]

As to the military side of aviation, Mr. Dalton wanted t know why the size of the Air Force had been doubled as a offensive weapon and why we had heard nothing about an defensive aerial weapon. He could not understand why i we were looking forward to a prolonged period of peace (t which sentiment Sir Samuel Hoare indicated assent) w needed to expand the Air Force. He and others of hi party viewed with grave concern the increase of air force in this and other countries.

Sq. Ldr. F. E. Guest (Bristol, Liberal) said that he wa disappointed and felt there was a lack of reality in Si Samuel Hoare's statement in that he failed to present th inner meaning of the responsibility which rested on the Ai Force. Sir Samuel Hoare presided over a Department o dynamite and he presented it to the House as if it wer chocolate cream.

He was glad to see the addition of two squadrons fo India and the additional flights for the Navy. They woul show to what extent the Air Arm could save the taxpayer by reducing the number of troops and ships.

He suggested that more should be published about th work of the Air Force in 'Iraq in the last twelve month and he wanted to know more about co-operation between th Air Force and the Army in India. Also he wanted to know what the Navy had to say about smoke screens and ga clouds. He suggested that the country should be told mor about the degree to which the Air Force could replace th older and more expensive arms, "with equal safety to th citizen and with advantage to the taxpayer."

Further he wanted to know to what extent the joint Staff of the three Services were putting their heads together an working out these problems. Did they meet round a table neither prepared to give way to anyone, or were they prepared to see the problem from each other's point of view [The Imperial War College is certainly doing a lot in thi direction, and perhaps if some of its work were made know all three Services might benefit.]

As to the next war, Sq. Ldr. Guest quoted Marshal Foc as saying :—

> I must impress upon you, gentlemen, to forget the last War; not to imagine that the next one will begin where that one left off. The next one will be as completely different from the last as the last one was from the one before.

[Which is another version of Maurice Baring's,—" One approaches every war as a novice."]

Also, Sq. Ldr. Guest reminded the House that the air fighting which took place over the lines in the last War was entirely due to the fact that the lines were there before the aeroplanes made their appearance, and that the next war would not be fought over trenches.

He remarked that there was an axiom in the R.A.F. which he was convinced was wrong, namely, that Civil Aviation must be left to fly by itself, and that the military side was in no way dependent on the civil side. [That maxim was coined by Sq. Ldr. Guest's old friend and leader, Mr. Winston Churchill. Civil Aviation *must* fly by itself if it is to become a commercial proposition, and hitherto Civil Aviation has unfortunately depended entirely on the military side for the production of its machines and for its supply of pilots, which is basically wrong.]

He argued that the military side must rest on the civil side because civil machines were now more easily convertible into war machines than they were five or six years ago, and that if a lot of them were available they were a potential force of bombing machines. [That is only true if the opposing forces have no fighters worth considering.]

He contrasted unfavourably our military air strength with that of France and our efforts in Civil Aviation with that of

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America and Germany. He also emphasised the excellent organisation of the American night-flying lines, and advocated the development of our Imperial air routes.

Referring to the Short Service system, he said that it had been a failure, as so many Short Service officers could not get work on leaving the Air Force, and added that many were simply in the streets doing commissionaires' work at clubs. He suggested that Imperial Airways should be paid £1,000 a year to take a young man of twenty-two, train him for commercial flying, and then let him go for three months to a Service squadron. [Sq. Ldr. Guest forgets that no possible development of Imperial air lines could possibly give us 150 new pilots a year and employ a mass of pilots increasing yearly at that rate. As it is, every employer of pilots almost invariably takes Short Service officers from the Air Force, and of them many prove to be useless for the hard routine and responsibility of civil flying, others lack initiative, or are unwilling to do anything except fly, and some are merely incompetent.]

Lieut.-Col. J. T. C. Moore-Brabazon (Chatham, Conservative), after congratulating Sq. Ldr. Guest on his good work as O.C. a Reserve squadron, and after humorously congratulating himself on having through his own eloquence made the Secretary of State for Air a Member of the Cabinet, wanted to know why the House was not allowed one day in which to debate National Expenditure on Armaments in its entirety instead of dealing with the Estimates of each Service separately.

He also wanted to know what was being done about the freedom of the air. We in this glorious island wanted to run services to various parts of our Empire, but always had to cross a foreign country to get there. It was intolerable to think that Persia could decide what route we were to take over her territory. What had Persia ever done for aviation except to invent the magic carpet? It was time the League of Nations, or some international body, took a hand in affairs.

He complained about the lack of encouragement for enterprise. The ideal of perfection in the R.A.F. was one machine, which never changed and could never be beaten. But the Air Minister was the only person who could reward inventions and developments. He referred to the fact that one firm in England (whose name he did not mention) developed the all-metal machine, but another firm had been given the orders along the lines of the firm with which the machine originated [One does not know to what Col. Moore-Brabazon referred, but there are some people who can design things, while other people make them better than does the designer. Also, there is the point that to maintain a strong and healthy Aircraft Industry orders for machines wanted in large quantities must be split up between the original designer and other firms whose designs have not been a success.]

On the subject of metal construction, Col. Brabazon said that it took 2½ horse-power working for a whole year to make a ton of aluminium, consequently the supply of aluminium was strictly limited, and that therefore we ought to concentrate on steel construction.

He advocated the construction of bigger and bigger flying-boats till we could get a seaplane big enough to have a billiard room inside it, "a really stable machine."

Finally, he warned the Air Minister against technicia
He told him not to forget that Lord Kelvin said that dy
mic flying was impossible. We needed more imagination
get ahead, and the people who stifled development were
technicians at the Air Ministry.

Mr. F. H. Rose (Aberdeen, Labour) delivered se
columns of Hansard which were worthy of Mr. Neon or
Spanner.

Mr. John Buchan (Scottish Universities) remarked
we were spending annually £120,000,000 in defence, and
this was a high premium for the amount of security assu
The Air Force was vital in any scheme of defence—
ever glad one would be, as Sir Hugh Trenchard said
Cambridge, if the Air could be abolished.

He argued that the Air Force provided a real means
economising in military defence. Its initial cost was lo
than either the Army or the Navy, and it was not divor
from the ordinary life of the country as were the Army
Navy, for it taught a large number of young men a mu
tude of crafts. There was less wastage in it than in
other Service.

He regretted that the Air Force only got half as m
money as the Army and only about one-third as much as
Navy. This year the Air Estimates showed a greater absol
reduction than those of any other Service and a far grea
proportionate reduction in spite of the new responsibility
Service had taken on overseas.

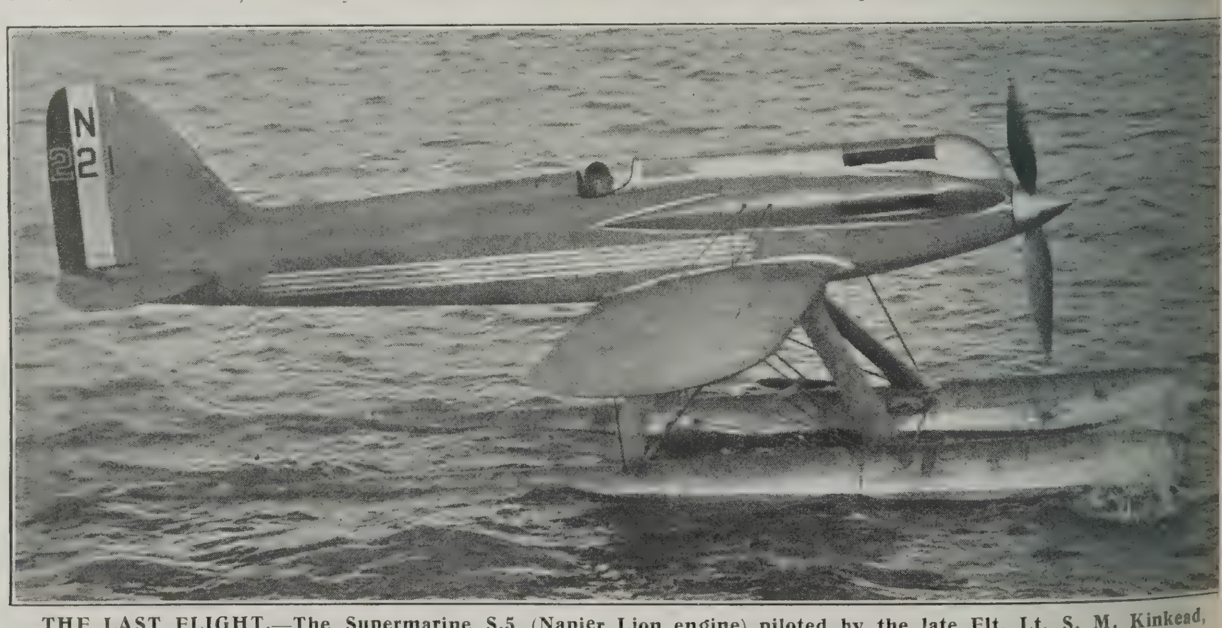
Rear-Admiral Murray F. Sueter (Hertford, Conservati
after the usual congratulations to previous speakers and a
commenting on the economies in the Air Service, sugges
that the Air Ministry ought to control people who want
fly the Atlantic. He suggested that they ought to h
doctor's certificates and should be "made to carry a fal
float-box" (whatever that may be) "or kites or wire
telegraphy equipment,—all three if possible. [Why all
solicitude for those who have so little regard for the feeli
of those most closely connected with them?]

He wanted to know how slotted wings were to be contro
in high altitude flying and whether there was any device
use when machines were taking off in a high wind.
he asked "Are the Research Department of the Minis
looking into this question of controlling slotted wings
[One imagined that the whole idea of slotted wings was
they automatically helped the pilot to control his machi
so why worry about controlling a thing which is itself a
matic?]

After touching lightly on Airships, the Schneider Trop
the Air Line to India and flying in the West Indies, Bri
Guiana, Singapore and Kenya, he complained that the N
was allowed to run away with £7,000,000 on obsolete bat
ships and said that the money ought to be used to help
Air Force.

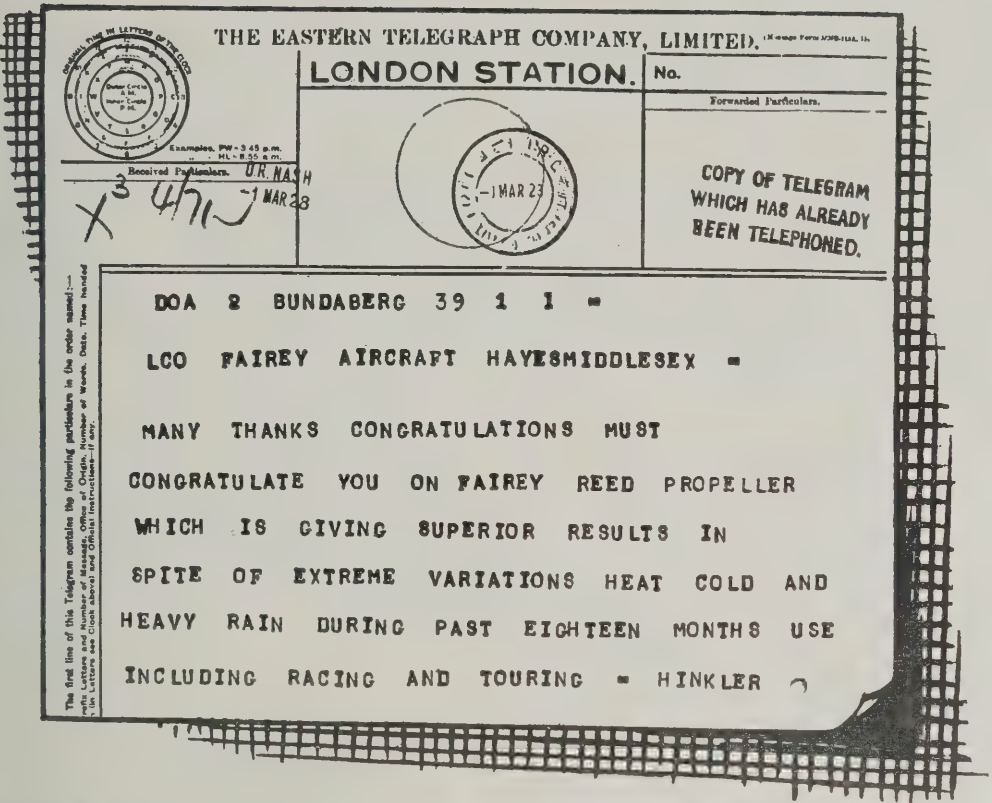
The Red Flag.

Mr. L'Estrange Malone (Northampton, Socialist), form
in the R.N.A.S., and notable as an exponent of Pelmani
said that we were making a mistake in building two
ships of different kinds. We ought to have built them b
of the same kind so that if an accident happened to one
could continue the experiments with the other. He sugges



THE LAST FLIGHT.—The Supermarine S.5 (Napier Lion engine) piloted by the late Flt. Lt. S. M. Kinkead, D.S.O., D.S.C., D.F.C., R.A.F., taken at Calshot just before the accident.

HINKLER'S GREAT FLIGHT



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that an air line to India could be run better with aeroplanes than with airships. He advocated more encouragement for Civil Aviation on the dual grounds that if you want an efficient Air Service you must keep the Industry going and that if you take the pacifist's view you must support the development of International air routes.

He wanted to know why the Germans could run their lines across France into the middle of Spain and why we could not run our lines across Europe. He advocated giving out Air Ministry orders so as to spread the work evenly instead of filling up the staffs of the firms one part of the year and sacking them at the end of it, and he accused the Air Ministry of being dominated "by military minds, by red tape and by red tabs." [Anyhow, that is better than being dominated by the Red Flag.]

MAJOR J. W. HILLS (Ripon, Conservative) said that Civil Aviation was in a bad way. He believed that it could be a great instrument for peace. Recognising the difficulty that we had no home air service upon which to build up our foreign air service as had the Germans, he said that we ought to develop Imperial communications, and he asked whether we had any good commercial flying-boat. He also referred to the possibility that our route to India was being blocked by Persia under the influence of a European Power. And he asserted [as Col. Paul Henderson has so often said] that the great progress of Civil Aviation would be on the ground, not in the air.

LT.-CDR. KENWORTHY (Hull, Labour) said that as long as we had an Air Service he would like to see it 100% efficient. He pointed out the inadequacy of our support of Civil Aviation and he complained that our aerodromes were all arranged for the defence of London, our principal shipping ports being left open to attack. He gave it as his opinion that the Air Ministry was weak on the Staff side and that it had nothing corresponding to the Plans Division in the Admiralty. He objected to the combination of Operations and Intelligence in one Department. [Would he have Operations without Intelligence?]

Still more did he object to Works and Buildings being under the Chief of the Air Staff, who, he said, should only deal with strategy and organisation. The Air Staff should be entirely divorced from all administrative work, and it should be making plans twelve or eighteen months ahead. [Evidently Lt.-Cdr. Kenworthy has a very slight knowledge of Air Ministry organisation or he would know that plans are being made for something very much more like twelve years ahead. A study of the Vote for the despised Works and Buildings would show him that.]

THE NAVY'S IDEAS.

COMMANDER C. BELLAIRS (Maidstone, Conservative) also said that the Air Staff should think in terms of War. He said that the Navy would have been bound to consider the question of merchant ships being bombed and torpedoed, and that it was the clear policy of France to torpedo and bomb merchant ships just as Germany submarined them in the late War. [If Cdr. Bellairs had studied the Estimates and had understood the references to flying-boat policy he might have been assured on this point.]

He reproached the Air Ministry with designing its own airships without consulting the Admiralty who were the original designers of airships. [The Air Ministry's own ship is being designed by people who long ago learned all that there was to learn from the Admiralty airship people, which was, in fact, only what they were able to learn from Zeppelins which had been shot down in England.]

He also lamented that after ten years we had only fifteen "commercial flying planes," or twenty if we added the fi in the Middle East. [One would like Cdr. Bellairs and oth critics on these lines to explain what we should do wi masses of "commercial flying planes" if we had them.] use a simile already familiar to regular readers of this pape comparing the air traffic from Croydon with the air trafi from Tempelhof is like asking why the number of freigh trucks handled at Penzance every day is so much small than the number handled at Manchester's biggest good depot.]

He also regretted the close alliance of Commercial a Service Aviation on the grounds that it made other natio suspicious, and he quoted the American Morrow Report saying: "The union of civil and military air activities wou breed distrust in every region to which our commerc aviation sought expansion." [Does he think that any int ligent nation could be gulled by dissociating the two branch of aviation, when every seafaring person has continua told us that the strength of the British Navy rests on t Merchant Navy?]

He quoted the U.S. Military Attaché in France in 1923 saying that the French in case of war propose to mobili their Army in 72 hours and their Air Force in 36 hours. the 36 hours before the Army is fully mobilised they propo to use their Air Force entirely against the military co munications of the enemy army. After which they rej their military units.

He added that nothing was said about attacking defen less towns and that if aeroplanes were so used the wasta would be so great that the nation which so wasted its for might find itself defenceless in the air within a month. [T is a most misapplied argument. Obviously air power wou of necessity, be used at first to delay the advance of enemy army. And the wastage, or casualties, in attacki such lines of communication would probably be higher, the enemy had a decent air force, than it would be if t machines were diverted to attack enemy towns and dodg the lines of the army's advance. For, obviously, the enem air force would be used primarily to make safe the arm lines of communication.]

He reverted to the antique question of splitting up the Force again between the Navy and Army, and quoted L Rothermere, the first Secretary of State for Air, as sayi that the Air Force was a purely temporary expedient prevent duplication. Italy, which had a separate Air For had reverted to the training of naval aviators by the Na because the air work in its first naval manœuvres had pro such a farce. [Which amounts to establishing a Fleet Arm like ours.]

MR. A. J. BARNES (East Ham, Labour) moved an ame ment urging the Government to put forward a program containing the abolition of naval and military air forces a the establishment of the International control of civil av tion. He talked ten columns of Hansard all on utte unpracticable pacifist lines, his arguments depending entir on the assumption that we can trust every nation in World, including the Tartar millions in Eastern Europe, let us alone if we abolish all armament and leave oursel defenceless.

MR. W. WELLOCK (Stourbridge, Labour) seconded amendment, his chief argument being that the people of nations are opposed to war. [If that be so how does account for the enormous popularity of war books and films among the rising generation of all nations?]

DR. A. V. DAVIES (Royton, Conservative), bringing hono able Members "back from the rarified atmosphere of ideali

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to the ordinary atmosphere of plain facts and commonsense," said that there was none in this House who wanted war but unfortunately people are not fully aware of the horrors of war and other countries have not accepted our proposals for disarmament. He wondered how many Members of the Opposition when they went to bed left their windows and front doors open and put their trust in burglars. Were not Trade Unionists organised to defend their own interests? Would the Socialist Party disband Trade Unions and trust to the honesty of the Masters?

Mr. Rennie Smith (Aberdeen, Conservative) said that so long as we believed that we were exposed to invasion by air there was no alternative except to build up aeroplane for aeroplane to defend ourselves, but he believed there was some alternative way to peace and security. He advocated the International control and regulation of aviation, civil as well as military.

Sound Reasoning.

Sir Philip Sassoon (Under-Secretary of State for Air) replying for the Air Ministry in an excellent short speech, said that it was certainly not the fault of this country that we had not made greater progress towards an agreement with other Powers. We had reduced our Air Force from 200 Service squadrons with 3,300 first line machines, at the date of the Armistice, to 69 squadrons with less than 800 first line aircraft; and whereas in 1918 we had 30,122 officers and 263,400 men, to-day our total personnel of officers and men barely exceeded the 1918 figure for officers alone. No other nation could show such a reduction.

Compared with the figures for 1925 British air expenditure showed a reduction of 10% for 1928 whereas the French figures for 1928 showed an increase of 45%. Italian figures showed an increase of 56% over the 1925 figures, and the figures for the United States showed an increase of 33-1/3%, so evidently we were not leading in the competition for air armaments.

As to Russia, Sir Philip asked whether it was our fault if those who are nearer to Russia than we are pay more attention to the record of blood in Russia in the past ten years than to the recent invitation on the part of Russia to complete a universal disarmament. He said that the British Empire, exposed as it would be by disarmament "in every part of the World to the envy and greed of the unscrupulous" was "asked to accept this glorious and noble gesture and strip itself of its means of defence."

As to a Board of International Control for Aviation he said that frankly such a solution in the present state of international relations was impossible. It would be just as practical to suggest that all shipping lines and railways should be under international control on the grounds that ships and railways were used for the transport of troops in war. He added,

> So long as armed forces is the arbitrament between men we cannot surrender the method of preventing savage warfare which of all methods has proved to be the least costly in men and money.

Mr. Lees-Smith (Keighley, Labour) made another pacifist speech illuminated by the statement that by building up all these great commercial air fleets, which could be converted into bombers at short notice, the nations were in fact building up attacking forces for air war, and that if nations limited the number of fighting aeroplanes alone there woul be a reduction in the defensive forces. He adduced thi argument in favour of putting commercial aviation unde International control. [One would like to know what h would propose to do about privately-owned aircraft. A fe patriotic men with money could quite easily produce a useful little fleet of high-speed fighters disguised as racin machines or high-speed tourers. Such machines could muc more easily be transformed for purposes of war than coul big, slow, lumbering aerial 'buses.]

He also argued that the International air lines should ru across Europe, or elsewhere, with an international staf [The trouble about that would be that as air travellers bega to know more about aviation they would absolutely refus to travel on air lines manned and maintained by certai nations. Passenger figures at Croydon and Berlin and Amsterdam already give a fair indication of what passenger think of the relative reliability of the aircraft of differen nations.]

An Epilogue.

The House having gone into Committee of Supply afte the defeat of the Amendment, Lt.-Cdr. Kenworthy move to reduce Vote 1 by 100 men, "in order to call attentio to a number of scandalous doings of the Air Ministry."

He complained that there was not a single municipa aerodrome in Great Britain [which has nothing to do wit the Air Ministry, and is purely the affair of the Cit Fathers.] The great majority of Service aerodromes we in the South of England for purposes of war, whereas the should be well to the North. [Where they would be ni and handy for bombing from Scandinavia if the Russian ever did jump control of the Baltic.]

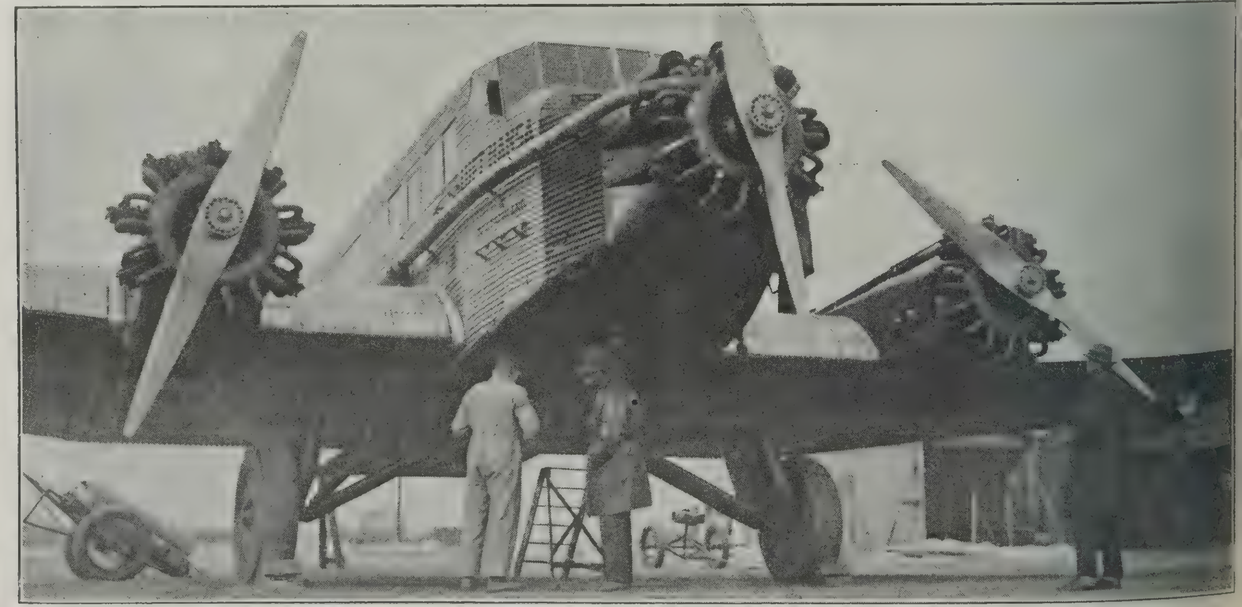
He said that the deadlock with Persia was because German-Russian company put up a civilian aerodrome Teheran, asked leave to run to Baghdad, and our ever-wis Government refused. He thought we should have jumpe at the chance of reciprocal arrangement.

For five years the Germans had prevented us from flyin from London to Prague, yet now they allowed the Frenc full facilities. This, he said, was due to lack of interest the Foreign Office because the Secretary of State for A did not use his influence with that Department.

He said that in 'Iraq the killing of women and childre was forbidden by the rules of Beduin warfare, which wa the national sport, but that if we bombed encampments an killed the women and children of the Wahabis we woul arouse a blood feud, and the Wahabis would retaliate 'Iraqi women and children. He did not want to see o Air Force in 'Iraq made the tool of the Government Baghdad, either in connection with the non-payment taxes or the carrying of bloody reprisals into the camps those tribes who engage in the national sport of cam raiding.

Similarly, he objected to the bombing of Kataba becaus the Imam had quarrelled with some protegés of ours. The was not much difference between the feelings of an Englis man whose house was bombed by a Zeppelin and the fee ings of an Arab when his camp or house was bombed by British aeroplane.

He objected to the school authorities of Greater Londo and the home counties being invited to organise scho



AN IMPOSING BOW VIEW.—A Junkers G.31 (three 450 h.p. Gnôme-Rhône Jupiter engines) which has been used by the Deutsche Luft-Hansa in connection with the transport of passengers to the Leipzig Fair.

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treats to Hendon to see attacks by aeroplanes on native villages.

He remarked that the King of Afghanistan was to be taken to see all the Fighting Services at work. Here, he said, we had a very welcome visit from a great Mahommedan ruler, and thus we showed him the results of nearly two thousand years of Christian culture and civilisation. This kind of thing was not conducive to the peace of the World.

SIR SAMUEL HOARE, replying, referred sympathetically to the death of Flt. Lt. Kinkead, and said :—

> Let us turn aside before I deal with the questions which have been raised in this Debate to offer our sympathy to his family, and pay a tribute of respect to one of the finest officers in the Force, a young man with an unrivalled record who might in the ordinary course have reached the highest post in his great profession. I am afraid the way of progress is strewn with sacrifices of this kind, none the less regrettable when they happen and particularly when they happen in the dramatic manner in which this tragedy took place this afternoon.

Continuing Sir Samuel said that we had no authority over local authorities to make them provide municipal terodromes but he had been trying to induce them to do so for years, not with very great success, and he asked Lt.-Cdr. Kenworthy to help him by making a beginning with the municipality of Hull.

He defended the position of our aerodromes.

He said that the honourable Member's explanation of the Persian deadlock was incorrect and that the desire of a German company to fly to Baghdad had nothing whatever to do with the refusal of the Persian Government. [Perhaps not directly. But perhaps the desire of certain officials of the German company may have influenced, financially, certain officials of the Persian Government.]

The difficulty about the line to Prague was not at present due to the German Government. The difficulty was providing a subsidy for the service.

As to Arabia, he assured the House that we were not at war with Ibn Saud and hoped we never should be.

As to Hendon, he thought that children went there just as he and other Members went, to see a very fine display of the best flying in the World, and he did not think that the Display encouraged militarist views.

LT.-CDR. KENWORTHY, on Vote 4, Works and Buildings, said that it would have been quicker and cheaper to hav taken over one of the large empty mansions in this countr as when Stowe was made into a new public school, than t have put up a grandiose building for the cadets at Cranwel [Surely this is bad Socialism? Why take over anythin which exists when men can be employed on Works an Buildings? And anyhow, where is there a great house hand to a great aerodrome?]

He added that the Home Secretary recently could not affor £100,000 for an enlarged Borstal Institute but that £260,0 could be spent on a Cadet College for the R.A.F. [One woul point out that the two institutions are not precisely simila either in cause or effect.]

He also remarked on the expenditure of half a millio pounds on the base at Singapore.

SIR SAMUEL HOARE explained that the accommodation Cranwell and Singapore was urgently needed.

MISS E. C. WILKINSON (Middlesbrough, Labour) remarke that a Member of the Labour Party had recently returne from Singapore and had stated at a meeting that the co ditions for workers, both European and native, were extr ordinarily bad, sanitary arrangements had practically broke down and that sickness was prevalent.

MR. H. E. CRAWFURD (Walthamstow, Liberal) said that had had experience in trying to use a private residence training premises for air officers and that it was more e pensive than building new premises.

As to Singapore, he said that many who objected to th expense of the naval works there might be prepared to g even further than the Air Ministry were as regards th aerodrome. We might well want additional accommodatio He asked whether the contemplated air establishment Singapore would be dependent upon large ships or whethe it would be an independent air force which could carry o without the use of large aircraft carriers.

SIR SAMUEL HOARE replied that the Base would be wante for both purposes.

Votes 2 and 3 were taken without discussion, and th House devoted itself, for the rest of the small hours, to th "Preservation of Lapwings Bill,"—a minor manifestation Aviation.—C. G. G.

THE RIO AIR SURVEY.

For some time those who are intimately concerned with ir survey work have known that the Aircraft Operating Co. Ltd., of 8, New Square, Lincoln's Inn, have been negotiating with the authorities of the city of Rio de Janeiro, Brazil, for a contract to map that interesting city and its suburbs. The announcement is now made officially that the tender of the Aircraft Operating Co. has been accepted, though it has been up against strong competition from foreign countries.

Embracing as it does not only aerial photography but ground survey of the most detailed kind, and ultimately the printing and publishing of the maps, this contract is in fact the biggest piece of air survey business that has yet been secured in the world. A remarkable feature of the survey is that apart from the general mapping of the whole area the central part of the city is to be mapped photographically on a scale of 63 inches to the mile, which means that every windowsill and chimneypot will be clearly visible.

Owing to the combination of air photography and ground survey, the whole job will be done in three years and three months from the date of starting work. On quite a conservative estimate, doing the same work by ground methods alone, leaving out the question of photographic maps themselves, would take some twelve years to complete.

The idea of the Rio Survey was first put up by Señor Antonio Prado, who is the Prefect of the Federal District of Rio. To improve the already beautiful city he engaged M. Agache, a French expert in town-planning. As the existing maps were unsuitable, or even misleading, Señor Prado and his assistants, Dr. Duarte, Director of the Public Works Department, and Dr. Seixus, Chief of the District Survey, decided to use air photography to help the ground survey, and so came in touch with the Aircraft Operating Co.

One may mention that in the preliminary negotiations much help was given by Brig.-Gen. Francis Festing, who has for some time been in South America in the interests of the Blackburn Co.

The actual work at Rio will be supervised technically by Col. H. L. Crosthwait, C.I.E., F.R.G.S., late R.E., formerly Superintendent of Survey in India. As Col. Crosthwait served with the famous Chile-Argentina Boundary Commission of 1902-3 he already has experience of South America and the ways of its people.

One gathers that probably the air survey work of Rio will be done by the new three-engined aeroplane which has been specially designed for air survey work to meet the equirements of the Aircraft Operating Co.

This contract means that the Aircraft Operating Co. wi have three expeditions at work at the same time—in Sout America, in Africa, and in 'Iraq, and there is every hop that the South American expedition will produce a gre deal more work for the firm in that continent..

The Rhodesian Survey for the Rhodesian Congo Bord Concessions Ltd., which altogether has covered about 52,0 square miles in Rhodesia, along with 1,000 square miles vertical photography, has been an immense success. O gathers that the whole area contemplated in the origin contract has not yet been covered, for the very good reaso that the amount so far done has provided so much work f the prospectors on the spot that air survey is being su pended to let the ground-workers catch up.

In the meantime the machines which were used in Nort ern Rhodesia have now been sent down South to survey th course of the Zambesi river and some of its tributaries, wit a view to improving the navigation on the river, by locatin rocks in the rapids, whose destruction would make th passage easier, and also with a view to helping railwa construction in that area.

In this connection a railway engineer who was recent flown along the Zambesi Valley expressed his opinion th ocular air survey, even before any photography was don would save railway surveyors a vast amount of unnecessa work and time, and would save the railway contracto thousands of pounds.

THE TRANSPORT OF GOLD IN SOUTH AFRICA.

The Johannesburg correspondent of *The Times*, in message dated March 16, reports that negotiations are pr ceeding in that city for the transport of Rhodesian gold air to the refinery at Germiston. An official of the Rhod sian Aviation Syndicate, Sir Alan Cobham, and Maj Miller have taken part in the negotiations. The Transva Chamber of Mines will probably establish a permanent aer drome near Germiston, with an eye to the possibilities transport of gold by air to Europe.

In a later message he states that the negotiations for th transport of gold from Rhodesia by air to the Rand refine are proceeding satisfactorily, and are likely to end in a fe days. It is proposed to use three specially designed D.H Moths to make regular collections from the mines. Th pilots will be armed. A road is to be constructed from th Germiston Aerodrome to the refinery along which the aer planes will "taxi" after landing. It is probable that th Germiston Aerodrome will be the principal airport of th Rand.

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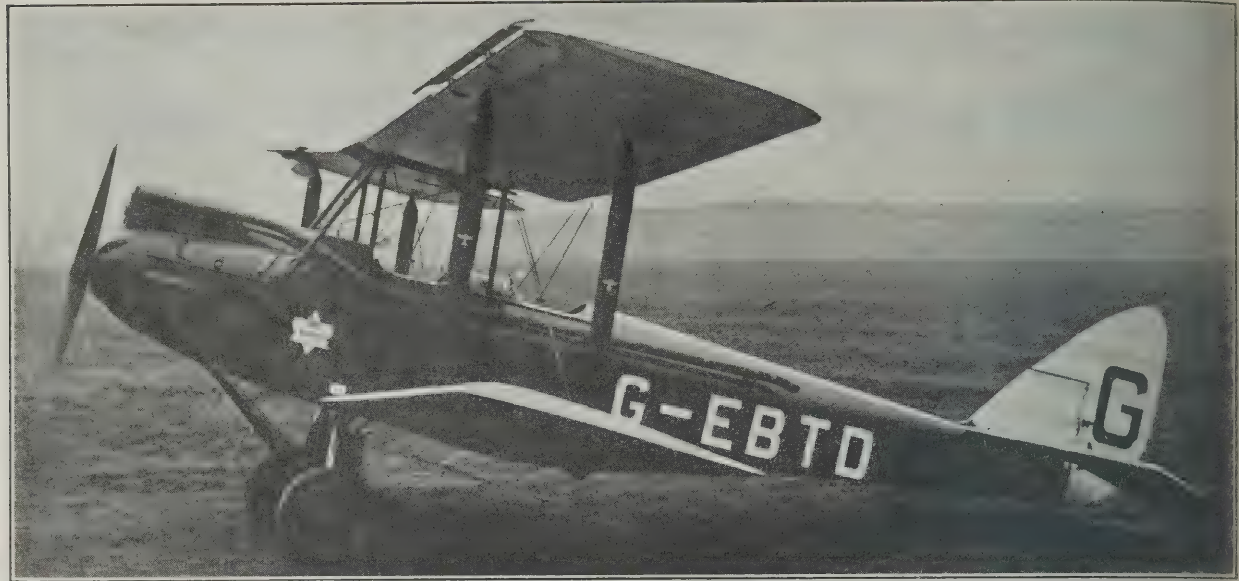
STALLING IN SAFETY.



THE SLOTTED MOTH.—The D.H. Moth fitted with the Handley Page automatic slots on which Capt. de Havilland gave his demonstration of stalled flying.—(*" Aeroplane " photograph.*)

On Monday, Mar. 19, Capt. de Havilland gave a convincing demonstration of how much can now be done to mitigate the dangerous results of errors of judgment in flying.

The machine used for this demonstration was an ordinary D.H. Moth except that it was fitted with Handley Page automatic slots over about one-third the span of the top wing, and in addition had a new undercarriage.

It should be noted that in this case the slots have no aileron behind them as the Moth has ailerons on the bottom wing only.

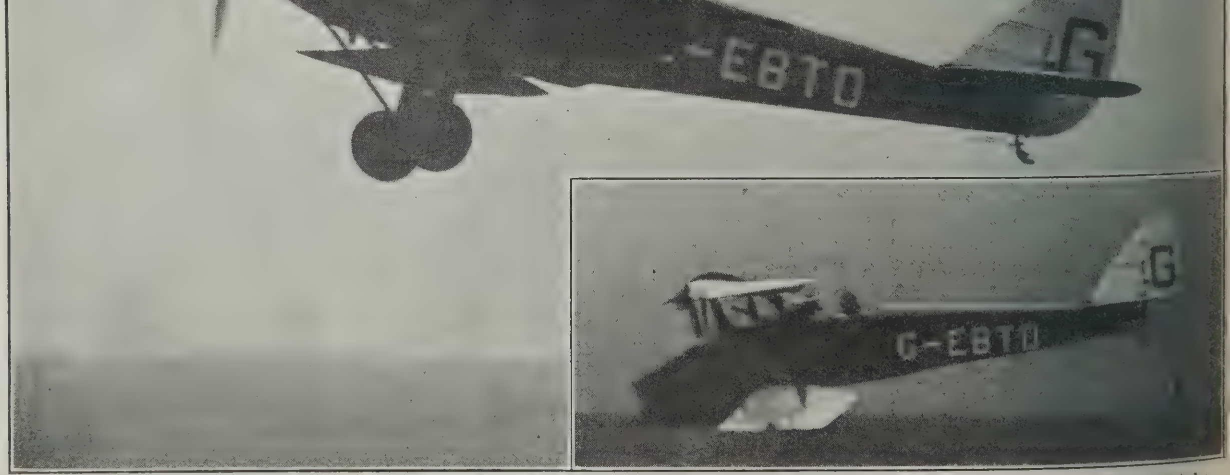
The new undercarriage—which is to be fitted to standard Moths in the future—is of the split-axle type, has a tread nine inches wider, and a travel about one-third as long again as that used hitherto.

In the first flight Capt. de Havilland stalled at about 200 ft. and tried to spin. On putting the rudder hard over, and not till then, the Moth dropped one wing in the ordinary way, but merely went into a steep open spiral at a fairly high speed, from which it recovered to straight stalled flight as soon as the rudder was centralised.

On the second flight the nose of the machine was pull
up violently at about 200 ft. The machine stood on its ta
lost forward speed, dropped its nose and dived until it
covered its minimum flying speed. After this it was allow
to descend stalled for some distance, its nose was put do
to recover flying speed, and then it was flattened out a
stalled at about 10 ft. from the ground and allowed to pa
cake. The machine merely sat down without any noticeab
run forward.

On the third flight the machine was not flattened out at
but allowed to glide into the ground at a speed well abo
its stalling speed. After hitting the ground it bounced
about fifteen feet, and then dropped stalled to the groun
showing no sign of any attempt to drop its nose. It final
came to earth just as in the previous flight.

On the fourth flight the machine was stalled at 250 ft., a
apart from a slight depression of the nose at about 75 f
made to bring the machine into a better position for landin
it was kept stalled right down to the ground. At a few fe
from the ground the nose of the machine fell slightly, a



STALLED!—Capt. Geoffrey de Havilland approaching the ground in a stalled condition, and, inset, immediately after hitting the deck.—(*" Aeroplane " photographs.*)

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ROLLS-ROYCE AERO ENGINES in a Handley-Page aeroplane flew from **ENGLAND** *to* **INDIA** *in* 1919.

ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew across the **NORTH ATLANTIC** *in* 1919.

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ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew from **ENGLAND** *to* **SOUTH AFRICA** *in* 1920.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew across the **SOUTH ATLANTIC** *in* 1922.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew **round AUSTRALIA** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Fokker monoplane flew from **HOLLAND** *to the* **EAST INDIES** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Handley-Page aeroplane flew from **BRUSSELS** *to the* **BELGIAN CONGO** *in* 1925.

ROLLS-ROYCE AERO ENGINES in Dornier-Wal flying boats flew from **MOROCCO** *to* **SPANISH WEST AFRICA** *in* 1926.

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its rate of descent seemed to increase—probably the result of a slight drop in the very light wind blowing.

The machine hit the ground, tail well down, descending at an angle that looked 45°, spread-eagled its undercarriage, and broke its fuselage through the front cockpit and dropped the nose of the engine onto the ground.

According to Capt. de Havilland there was no noticeable bump—just a soft crunch—and he was not thrown forward from his seat.

In this particular Moth the combination of slots, controls and undercarriage have been arranged to give the maximum of safety for ordinary purposes, and the machine is not necessarily suitable for such purposes as military training in which acrobatic flying is necessary.

The demonstration given shows very convincingly how far the dangers of the more common errors of judgment may be minimised by proper use of slots, and an adequate undercarriage.

The de Havilland Co. are however very emphatic in stating that there is no excuse even with such a machine for encouraging a smaller degree of care in flying.

With properly-proportioned slots and with the other controls properly co-ordinated, spinning can be made impossible. A stalled machine however is still a machine under limited control, full normal control can only be achieved from this condition by putting down the nose and accelerating its downward velocity—which is dangerous close to the ground.

At the same time when a stall occurs too close to the ground for recovery, the freedom from spinning combined with a suitable undercarriage, permits of alighting without recovery from the stall, with practically no risk to the occupants, and relatively little to the machine.

In this connection it should be recorded that in Capt. de Havilland's final alighting no part of the undercarriage itself failed. The cross-members in the bottom of the fuselage failed in compression and allowed the undercarriage legs to close inwards at the top and spread out at the bottom, and the sides of the fuselage at the same time failed in bending and shear.

There was no telescoping of the fuselage—on the contrary both cockpits opened wide as the result of the failure, and the occupant of the front seat, had there been one, would have escaped injury as completely as did the pilot.

It is also worth noting that the fuselage in question was of the standard Moth type and not specially reinforced to suit the new undercarriage. It had been subjected, prior to the demonstration, to a dozen or so landings similar to that which finally caused it to fail.

THE BEARDMORE INFLEXIBLE.

That highly interesting experiment in very big all-steel aircraft,—the Beardmore Inflexible, with her three Condor engines,—seems to be doing very well at Martlesham. Quite unofficially, but quite reliably, one hears that she handles surprisingly easily for a craft of her size.

When she was being built none had any doubts about the strength of the structure, but there was much doubt about her controllability. Here the Beardmore firm were fortunate in having the experience of Sq. Ldr. R. A. de Haga Haig, at their disposal. As one of the best test-pilots of big or little machines that Farnborough has known, Sq. Ldr. Haig's judgment of the qualities of any type of machine is naturally of high value.

Though not officially an engineer or technician he has by nature that mechanical ability and that faculty of seeing what is wanted which is so much more valuable than any amount of training in theory. Consequently, to his good sound practical knowledge may be ascribed the rather unexpected success of the Inflexible,—for, to be frank, a good many people did not expect such immediate good results from such a large and purely experimental machine.

One hopes that, encouraged by this success, the Beardmore firm will extend its aircraft operations,—though not necessarily in "out sizes." Despite the number of firms in the Aircraft Industry, there is still plenty of room for new machines of all types, Service and Civil, to improve on those which exist.—C. G. G.

FLYING-BOAT EQUIPMENT.

The paper read by Flt. Lt. B. C. H. Cross, D.F.C., before the Royal Aeronautical Society on Mar. 15 dealt with a number of important but often neglected items of the equipment of flying-boats.

Flying-boats to-day were fitted with attachments originally designed for touring, and these attachments had been adapted for mooring purposes. They were not altogether suitable for this, and some arrangement permitting mooring from a point further off was desirable.

Anchors for flying-boats presented a problem. Small motor-boats were required by Lloyds to carry anchors much heavier than could be used on flying-boats which when anchored ha a far greater drag than the motor-boat. Nobody seemed t know anything about anchor design and experiment on thi subject was necessary. Some experiments had been mad and some improvement in the efficiency of anchors had resulted.

Standardisation of fuelling arrangements for flying-boat was very necessary. Petrol was supplied in containers var ing from 60-gallon barrels to 2-gallon tins, according to t part of the world. It might be brought alongside in a bar or motor-boat, be dumped on the end of a pier, or just l on the beach. At present flying-boats had to carry their ow pumping gear for handling fuel in all conditions. An inte national agreement to standardise hose-coupling sizes throug out the world for fuel systems for civil flying-boats shoul be attempted.

Steps and shelves at present provided for access to engin were all of the nature of afterthoughts. Folding steps adequate size on which the mechanic need not hold on wi one hand while he worked with the other were very necessar Also it was desirable to fit in the engine cowling trays which tools and parts could be laid to save their loss ove board.

For the comfort of crews on long cruises, proper storag for food—including protection from flies—was most importan A table at which meals could be taken and some form meal-time ritual was necessary to avoid confusion.

Fatigue of the crew was largely the result of exposure wind and noise, and properly closed in cockpits would great lessen this. Automatic piloting gears, which would secu more accurate course-keeping, would also help.

In future large Service flying-boats much larger crew than were at present employed would be desirable. H thought three pilots, one engineer per engine, a rigger, tw wireless operators and a cook would be desirable. Th large crew was necessary rather to look after the work th had to be done between flights—such as refuelling, an general inspection and overhaul—than for the actual flyin With small crews this work took so long that only a sho proportion of the total time of a cruise could be spent in th air.

THE BRITANNIA TROPHY.

The Royal Aero Club announces that the Britannia Troph has been awarded to Lieut. H. H. Bentley, A.F.C., S.A.A.F for his solo flight from London to Cape Town in a D.H Moth (A.D.C. Cirrus engine) between Sept. 1-28, 1927.

The Britannia Trophy was presented to the Royal Ae Club by Mr. Horatio Barber, to be awarded each year to th British aviator who, in the opinion of the Committee, sha have accomplished the most meritorious performance in th air during the year.

THE COMMAND OF THE R.C.A.F.

Group Capt. J. H. Scott, Officer Commanding the Roy Canadian Air Force, has resigned in order to begin a co mercial career. He will be succeeded by Wing Cdr. J. Gordon, R.C.A.F.

THE DANIEL GUGGENHEIM SAFE AIRCRAFT COMPETITION.

In view of certain questions which have been raised regard to the Daniel Guggenheim Safe Aircraft Competitio the following rulings have been made by the Trustees of th Fund :—

1. *Question* : Supposing a machine was entered on Sept. 1927, and was delivered in New York in March, 1928, wou that machine with its pilots and mechanics be expected remain on the "designated field" until the closing of th Competition some time after Oct. 31, 1929?

Ruling : After the completion of the tests and the awardin of the points, there would be no necessity for the aircra to remain at the field. The number of points awarded is sufficient record.

2. *Question* : What of the extreme difficulty of obtaining really fair comparison of merits as regards stick and unsti due to inevitable variation of wind?

Ruling : If "calm" air is not obtainable tests of th character will be repeated under different wind conditio and curves of distances plotted against wind speed.

3. *Question* : In calculating cargo space, what weights sh be specified for pilot, observer and instruments fitted by th Fund?

Ruling : For the purpose of calculatingthe cargo space f which provision must be made the combined weight of pil observer, and any special instruments or equipment fitt by the Fund for the purpose of the Competition is to taken as 400 lbs.

4. *Question* : To obviate ground effect, at what altitude w speed tests be run?

Ruling : The test for speeds will be at such an altitude as preclude the possibility of ground interference.

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THE R.A.F. DISPLAY FOR THE KING OF AFGHANISTAN.

A Display was given by the Royal Air Force at Hendon on March 17 in honour of Their Majesties the King and Queen of Afghanistan. The Units taking part in the Display all belonged to the Air Defence of Great Britain under the command of Air Marshal Sir John Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., who received Their Majesties on their arrival at Hendon.

The King and Queen of Afghanistan were accompanied by the Secretary of State for Air and the Lady Maud Hoare, and Marshal of the Royal Air Force Sir Hugh Trenchard, G.C.B., D.S.O., and members of their Suite, who had been with them during their visit to the School of Technical Training (Apprentices) at Halton during the morning of the same day.

The organisation of the Display was perfect, and the whole affair once more demonstrated the efficiency and despatch with which the Royal Air Force can show examples of its training for the benefit of the Country's Distinguished Guests or the General Public.

An interesting feature of the Display was the fact that every machine taking part was of post-war design. This, so far as one knows, is the first Display at which no war-time aircraft took part. The whole Display only lasted ninety minutes, and contained a programme of eleven events. As at the Annual R.A.F. Displays at Hendon the events followed each other without any delay at all, and in some cases they overlapped each other, but without confusion. All the flying was done directly in front of the spectators and at a convenient height, which eliminated that straining to look upwards which makes flying meetings such an exhausting business for the spectators.

The official programmes were printed both in English and Persian.

The first event on the programme was described as Converging Bombing, and consisted of a continuous attack by a flight of Grebes from No. 25 (Fighter) Squadron on three tents set up on the aerodrome. The bombs were dropped from about 50 feet and no bomb-sights were used. The machines dived on their target from changing directions, and the accuracy of aim was remarkable. All three tents were destroyed by fire in a few minutes. There were sceptical murmurs among the spectators on the subject of firing the tents by wire, but even if this were the case the bombing was accurate enough to have destroyed the tents without any outside assistance. The destruction of the tents made a much more effective spectacle than the usual bombing of a tank.

This was followed by a demonstration of formation flying controlled by Radio Telephony. The Squadron concerned in this was No. 56 (Fighter) Squadron (Siskins) and the formation flying was particularly well done. Every change of direction and formation was made with great precision, and the final movement, consisting of a long slow spiral from several thousand to a few hundred feet by the whole Squadron in line ahead, was particularly effective.

The next item was the spectacular and grisly demolition of a Hyderabad by two Grebes. After a short, sharp battle the Hyderabad and one of the Grebes dived down and disappeared, with a great expenditure of smoke and win flares, in the direction of Cricklewood. A dyspeptic onlooker was heard to observe that he hoped that Mr. Handle Page at Cricklewood would charge them full landing fees One understands that it was shortly after this that Thei Majesties decided that they would not have time for a fligh in a Hyderabad.

While this grim R.A.F. joke was going on No. 11 (Fighter) Squadron (Siskins) was lining up facing the railings with each machine attended by its pilot and tw mechanics. This event was named in the programm "Battle Squadron Getting Away," and was alleged t demonstrate the rapidity with which a Fighter Squadro could take the air on an alarm being given. Some of th spectators thought that the machines would start straigh off, and either demolish the railings or leap over them; bu as a matter of fact they were started up while the pilot put on their parachutes and climbed into the machines, an then they turned half-right and taxied out across the aerodrome in a line, and left the ground in flight formation The time from the signal till they had all left the groun was five minutes 30 seconds, and the spare machine was no needed.

A little more realism might be added to this event fo future occasions by having all the pilots and mechanic asleep in a small camp a few hundred yards away when th alarm is sounded. The camp could be the scene of th demolition by the low bombers later on in the programme No. 111 Squadron finished off its exhibition with some ver pretty formation flying in front of the grand-stand.

The next event consisted of the take-off of two Wings Fighter Squadrons. The Squadrons were No. 41 (Siskins Nos. 3 and 17 (Woodcocks), Nos. 23, 32 and 43 (Gamecocks The machines took off in squadron formation. Each formation was perfect, in spite of the bumpy atmosphere, an each alternate Squadron took off on a course slightly di ferent from the Squadron immediately in front, with a ver pleasing effect.

They disappeared into the blue, and did not come bac until it was time for them to fly past in the Salute in th 9th Event on the programme. There was no ground f the theory that they had gone to have a look at the Inte national Rugger match at Twickenham.

As soon as they were clear of the aerodrome No. 1 Squadron came out on Foxes. The machines dived, b flights, on an imaginary target in front of the Royal encl sure, an exhibition which demonstrated the speed an manœuvreability of these machines with remarkable effe tiveness. The third Flight only consisted of two machine and there was much speculation as to whether (a) the nint Fox was sulking, (b) it had met with an accident on its wa to Hendon on the previous day, or (c) whether its absenc was intended to point a moral to those members of th Houses of Parliament who are, have been, or will, try t hack bits off the Air Estimates.

In the meantime from the back of the aerodrome tw Grebes had leapt into the air, and a display of individua

THE ROYAL PARTY.—Their Majesties the King and Queen of Afghanistan watching the R.A.F. Display at Hendon on March 17.

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" WITH ALL THE CUNNING MANNER OF THEIR FLIGHT."—Formations by Fighter Squadrons of the R.A.F. during the Display at Hendon on Mar. 17 in honour of Their Majesties the King and Queen of Afghanistan. At the top on the left are Gamecocks of No. 32 Squadron, and below them the R/T controlled formation by Siskins of No. 56 Squadron. Above on the right is No. 41 Squadron on Siskins. Below them is a flight of Woodcocks from No. 17 Squadron.—(*" Aeroplane " photographs.*)

aerobatics by two pilots of No. 19 (Fighter) Squadron began. The pilots were Flg. Offs. P. P. Grey and P. R. Barwell, and they gave a delightful exhibition of slow and flick rolls, upward spins, clean loops, and all the rest of the graceful stunts which are part of a Service pilot's training.

When they landed a Flight from each of four twin-engined Night-Bombing Squadrons took off in formation. There was something very dignified about these leisurely veterans, which even the debauched look of one of them staggering along on one engine as they came back into the wind could not spoil. The machines were Virginias from No. 7, No. 9 and No. 58, and Hyderabads from No. 99 Squadrons.

While they were circling round the aerodrome the two Wings of Fighters came back and flew past the Royal Enclosure in formation dipping in salute. It was interesting to notice the slight variation in Squadron formation adopted by the different Squadrons. Some of the Squadrons were packed closer than others, and in the case of No. 3 Squadron the Flights were wider apart but each flight was more compact. No. 32 Squadron had the closest formation, as far as one could see, and No. 43 Squadron left the saluting base in a beautiful climbing turn.

After this the remaining aircraft took off from the ground, and last of all the Bombing Squadrons flew past in Flight formation.—C. M MCA.

MAJOR DAVIDSON, U.S. AIR CORPS.

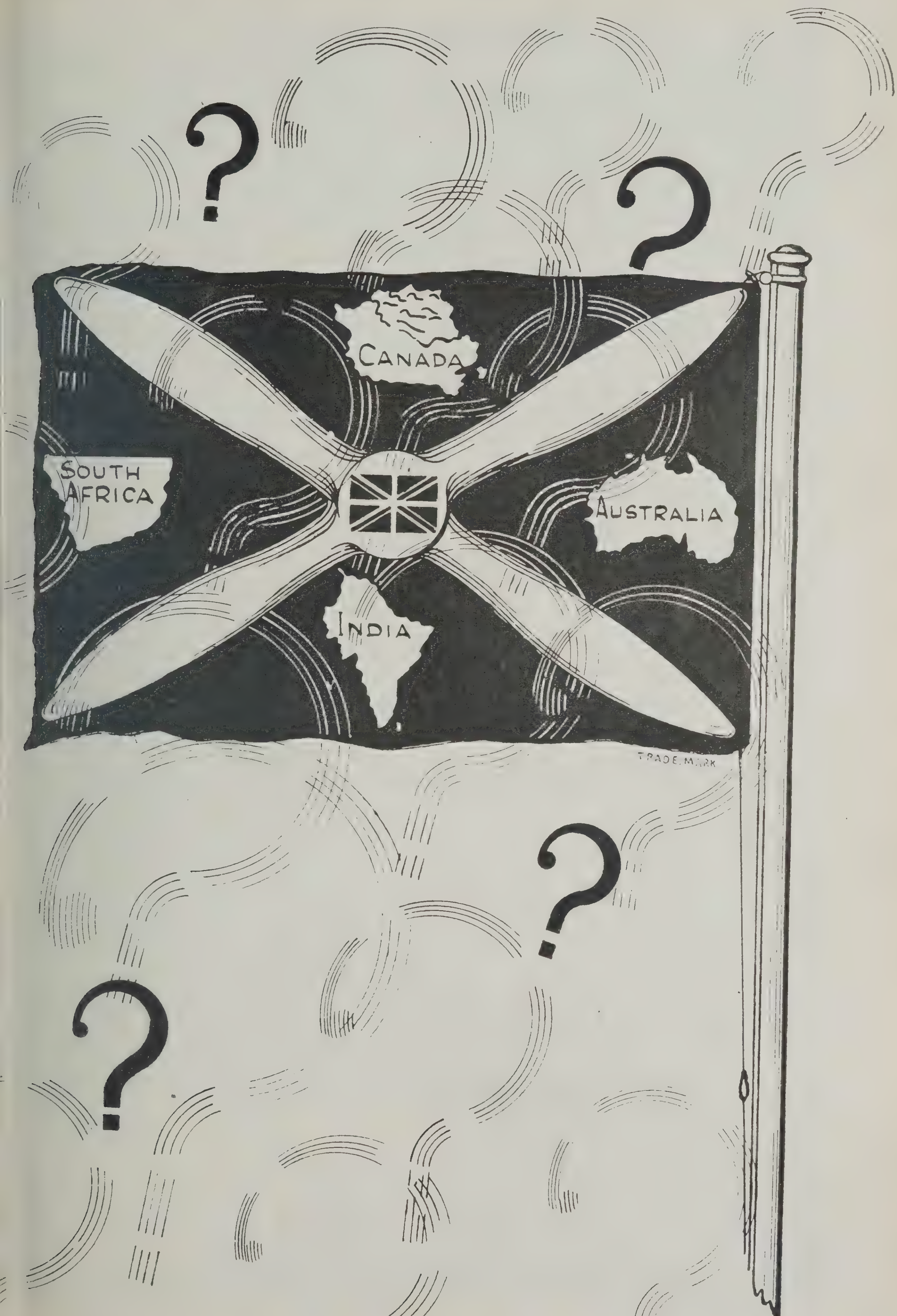
His many friends in England will be glad to hear that Major Howard C. Davidson, U.S. Air Corps, until lately Assistant Military Attaché for Aviation at the American Embassy, has been appointed to command Bolling Field, Washington, D.C.

Bolling Field is in many ways the best command of its kind in the States and it is certainly the most pleasant. As flying field it is delightfully situated, but its chief charm the fact that it is at Washington and so is in touch with a that is best in America. Against this perhaps there is th objection that it is rather too close to the Army Bureau, an to Congress, so that its personnel are apt to be bothered b visits from officers of exalted rank and Members of Parli ment. But in spite of that it is a good spot and one wishe Major Davidson every success in his new command. An one would congratulate Bolling Field on its new Commandin Officer.—C. G. G.

THE FRENCH MILITARY AIR ARM.

The following extract from *The Times* is of considerab interest and discloses a state of affairs which can only b described as amazing in view of the importance with whic France is said to regard its military air arm :—

> Parliament has been discussing questions concerned with militar aviation; but the fact is that the French military air arm is n longer in legal existence. For over three months it has been legall extinct. It was constituted as a combatant arm on Dec. 8, 1922, bu the Law which was then passed was valid only for five years an expired last December. A new Law should, in the meantime hav been prepared and passed, but this was not done. A Bill was, i fact, drawn up by the Ministry of War and this was submitted Parliament, but it got no farther than the Senate, where it is no held up and no *ad hoc* measure has been devised.
>
> The consequences are not merely ludicrous, for promotion has bee suspended since Dec. 9 last; the Gazette which should have been issue on Dec. 25 has never appeared in the *Journal Officiel*, and air office are naturally not encouraged by this evidence of slackness at th Ministry of War. For the present France is officially without military air arm, and she may remain so for some time unless th authorities remember to draw up an *interim* measure before tl dissolution of Parliament.


?
?
CANADA
SOUTH AFRICA
AUSTRALIA
INDIA
TRADE MARK
?
?

THE ROYAL AIR FORCE.

The London Gazette.

Mar. 13.

General Duties Branch.—The following are granted S.S. comns. as Plt. Offs. on probation with effect from and with seniority of Mar. 2:—R. Y. Bootes, A. M. Cowell, A. J. P. Groom, A. Haywood, A. D. Jaffé, R. V. Redpath (Sec. Lt., R.A. (T.A.)), R. E. S. M. Vinning, A. H. Westwood. The following Flg. Offs. are transferred to the Reserve:—J. A. Mollison, Class C (Mar. 14); J. E. Doran-Webb, Class A (Mar. 15). Flt. Lt. Ll. R. Briggs is placed on the retired list at his own request (Mar. 14). The S.S. comn. of Plt. Off. on probation J. D. Allcroft is terminated on cessation of duty (Mar. 10).

Stores Branch.—Flt. Lt. G. Baker is restored to full pay from half-pay (Mar. 8).

Medical Branch.—Flt. Lt. J. D'I. Rear is granted a perm. comn. in this rank (Mar. 14); Flg. Off. G. S. Strachan, M.B., is promoted to the rank of Flt. Lt. (Mar. 1); Flt. Lt. D. B. Smith, M.B., is transferred to the Reserve, Class D ii (Mar. 19); Flt. Lt. E. Alston (temp. Capt., Dental Surgeon, General List) relinquishes his temp. comn. on resignation of his Army comn. (Feb. 29).

Chaplains Branch.—The Rev. F. W. Hilborn is granted a S.S. comn. as a Chaplain, with the relative rank of Sq. Ldr. (Mar. 2).

Memoranda.—The permission granted to Sec. Lt. T. L. Calvert to retain rank is withdrawn on his enlistment in the ranks of the R.A.F. (Feb. 21). The following are deprived of permission to retain rank on conviction by the Civil Power:—Lt. H. Rowbotham (Dec. 10, 1927); Sec. Lt. C. W. File (Feb. 2).

Reserve of Air Force Officers.—General Duties Branch.—The following are granted comns. on probation in the ranks stated, with effect from Mar. 13:—Class A.—Flg. Off. G. E. F. Boyes, Plt. Off. H. J. Padfield. Class B.B.—Plt. Off. T. Herbert. D. L. Eskell is granted a comn. in Class C as Flg. Off. (Mar. 13). The following Plt. Offs. are promoted to the rank of Flg. Off. (Mar. 13):—A. L. Muir, E. K. Rayson. Flg. Off. E. P. Clacey is transferred from Class C to Class A (Mar. 5); Flg. Off. R. F. Overbury is transferred from Class A to Class C (Mar. 9); Flg. Off. H. J. Price is transferred from Class B to Class C (Jan. 29).

Auxiliary Air Force.—General Duties Branch.—No. 601 County of London (Bombing) Squadron.—The following Plt. Offs. to be Flg. Offs. (Feb. 17):—R. Bellville, J. S. Schreiber.

Appointments.

Week ending Mar. 19.

General Duties Branch.—Group Captains W. G. S. Mitchell, C.B.E., D.S.O., M.C., A.F.C., to H.Q., Aden Command, 8/3, to command from date of arrival. J. B. Bowen, O.B.E., to H.Q., 'Iraq Command, for Technical Staff duties, 9/3.

Wing Commanders D. A. Oliver, D.S.O., O.B.E., to H.Q., 'Iraq, for Air Staff (Training) duties, 9/2. R. Leckie, D.S.O., D.S.C., D.F.C., to H.M.S. *Courageous*, for duty as Senior R.A.F. Officer, 21/2. R. M. Field, to H.M.S. *Eagle*, for duty as Senior R.A.F. Officer, 9/3. A. H. Jackson, to No. 3 F.T.S. (Cadre), Spittlegate, to command, 1/3.

Squadron Leaders A. R. Arnold, D.S.C., D.F.C., to No. 17 Sqdn., Upavon, 31/3. G. F. Breese, D.S.C., to R.A.F. Depot, Uxbridge, 27/2. The Hon. R. A. Cochrane, A.F.C., to H.Q., Aden Command, 8/3. W. A. McClaughry, D.S.O., M.C., D.F.C., to Wessex Bombing Area H.Q., Andover, 22/2.

Flight Lieutenants E. B. C. Betts, D.S.C., D.F.C., to No. 3 F.T.S. (Cadre), Spittlegate, 20/3. A. J. E. Broomfield, D.F.C., to Fighting Area H.Q., Uxbridge, 1/3. H. J. Gemmel, to Fighting Area H.Q., Uxbridge, 11/2. R. R. Greenlaw, M.B.E., and L. G. Nixon, to R.A.F. Depot, Uxbridge, 6/2. G. G. Banting, to No. 3 F.T.S. (Cadre), Spittlegate, 18/3. F. G. A. Robinson, to No. 3 F.T.S. (Cadre), Spittlegate, 1/3. N. H. Jenkins, O.B.E., D.F.C., D.S.M., and G. H. Smith, to H.Q., 'Iraq, 8/3. J. Cottle, M.B.E., D.F.C., to Armoured Car Wing, 'Iraq, 8/3. C. W. Attwood, to H.Q., Aden Command, 8/3. G. V. Howard, D.F.C., to Armoured Car Wing, 'Iraq, 9/3. C. G. Halliday, to No. 30 Sqdn., 'Iraq, 9/3. G. H. Russell, D.F.C., to No. 6 Sqdn., 'Iraq, 9/3. T. G. Bird, to Aircraft Depot, 'Iraq, 9/3. A. W. Fletcher, O.B.E., D.F.C., A.F.C., to No. 3 F.T.S. (Cadre), Spittlegate, 12/3. E. J. D. Townsend, to R.A.F. Station, Upper Heyford, 25/3. A. L. A. Perry-Keene, to No. 6 Sqdn., 'Iraq, 24/2. S. D. Macdonald, D.F.C., to R.A.F. Depot, Uxbridge, 10/3. J. N. Boothman, to No. 30 Sqdn., 'Iraq, 24/2. J. V. Kelly, to H.Q., Transjordan and Palestine, 3/3.

Flying Officers A. Lees, to Armoured Car Wing, 'Iraq, 24/2. J. E. Preston, to No. 45 Sqdn., Middle East, 1/3. W. L. Robertson, to Armoured Car Section, Aden, instead of to No. 8 Sqdn., as previously notified, 14/1. V. Harris and W. L. Robertson, to Armoured Car Section, Aden, 12/1. S. R. Sunnucks, to M.A.E.E., Felixstowe, 9/3. L. S. Birt, to M.A.E.E., Felixstowe, 3/3. P. B. Chubb, to A. and G. School, Eastchurch, 29/2. B. B. Dowling, to R.A.F. Depot, Uxbridge, 1/3. H. V. Smith, D.C.M., to No. 6 Sqdn., 'Iraq, 9/3. M. H. Garnons-Williams, to H.M.S. *Eagle*, 9/3. E. B. Forster, C. V. Lock, J. J. Nolan, L. H. Ross, W. F. Rimmer, and P. B. Chubb, to H.Q., 'Iraq, 8/3. T. J. O'Doherty, to No. 4 F.T.S., Middle East, 9/3. P. McK. Terry, to No. 70 Sqdn., 'Iraq, 9/3. N. J. Wiltshire, to Armoured Car Wing, 'Iraq, 8/3. W. A. Shorten, to E. and W. School, Flowerdown, 10/3. D. F. W. Atcherley, to No. 2 Sqdn., Manston, 20/2.

Pilot Officers B. W. Barton, to R.A.F. Training Base, Leuchars, 20/2. H. B. Collins, C. E. Kay and W. T. Walton, to No. 2 Sqdn., Manston, 20/2. A. R. Ward, to R.A.F. Training Base, Leuchars, 20/2. P. F. G. Bradley and R. C. Hancock, to No. 2 Sqdn., Manston, 20/2. P. D. Cracroft, R. David, S. Hatton, G. N. S. Lane and A. G. C. Somerhough, to R.A.F. Training Base, Leuchars, 20/2. G. W. Monk, to No. 13 Sqdn., Andover, 20/2. J. E. Stuart-Lyon, to No. 4 Sqdn., S. Farnborough, 20/2. R. G. Forbes, to No. 13 Sqdn., Andover, 20/2. J. B. Knapp and F. J. Taylor, to No. 216 Sqdn., Middle East, 19/2. R. F. Gandy, to No. 30 Sqdn., 'Iraq, 24/2. J. H. L. Maund, to No. 14 Sqdn., Palestine, 23/2. J. W. Wood, to No. 30 Sqdn., Iraq, 24/2. R. Y. Boutes, A. M. Cowell, A. J. P. Groom, A. Haywood, A. D. Jaffe, R. V. Redpath, R. E. S. M. Vinning and A. H. Westwood, to R.A.F. Depot, Uxbridge, on appointment to S.S. Comns., 2/3.

Medical Branch.—Flight Lieutenant J. A. Perdrau, M.D., to N
F.T.S. (Cadre), Spittlegate, 1/3. Flight Lieutenants (Dental) J
Jamie, to H.Q., Halton, on appointment to a Temp. Comn., 1/3. J
Williams, to Home Aircraft Depot, Henlow, 19/3.

Flying Officers (Dental) S. McC. Craig, to R.A.F. Station, N
Weald, 14/3. H. E. Glover and G. M. Titterington, B.D.Sc., to R
Depot, Uxbridge, on appointment to Temp. Comns., 12/3. Fl
Officer (Q.Master Medical) P. H. Musgrave, to R.A.F. General
pital, 'Iraq, 20/2.

Stores Branch.—Wing Commander E. J. Sayer, M.C., to Supply
Stores Depot, Aden Command, 8/3.

Flight Lieutenants G. Baker, to Supply Services, 'Iraq, 9/3. H
Webb, to Station H.Q., Bircham Newton, 5/3. W. St. J. Littl
to R.A.F. Depot, Uxbridge, 2/3. E. S. Bullen, M.B.E., to Air Min
Directorate of Equipment, 5/3.

Flying Officers N. Dainty, to R.A.F. Depot, Uxbridge, 2/3. E
Bamber, to R.A.F. Depot, Uxbridge, 5/3. C. Littlejohn, M.M., to
Ministry, Directorate of Equipment, 5/3. H. Sleigh, to No. 3 F
(Cadre), Spittlegate, 1/3. J. G. Smithson, to School of Naval Co-op
tion, Lee-on-Solent, 2/3. H. D. Giblett, to No. 45 Sqdn., M
East, 1/3.

Accountant Branch.—Flying Officers F. J. S. Short, to R.A.F. D
Middle East, 1/3. J. Charles to No. 216 Sqdn., Middle East,
W. F. Barrell, to R.A.F. Station, Worthy Down, 12/3.

Chaplains Branch.—The Rev. A. W. Brown, M.A., B.D., to No
Sqdn., Middle East, 9/3.

Fatal Accidents.

The Air Ministry regrets to confirm the information, wh
has already been widely published, that as the result
an accident at Calshot, on Mar. 12, to a Supermarine
machine, Flt. Lt. Samuel Marcus Kinkead, D.S.O., D.S
D.F.C., the pilot and sole occupant of the aircraft,
killed.

The Air Ministry regrets to announce that as the resul
a collision in the air at Manston between a Bristol Figh
machine of No. 2 (A.C.) Squadron, and a Vickers Virg
machine, of No. 9 (B) Squadron, on Mar. 14, Flg. Off. Hon
James Joseph Mumford-Mathews, R.A.F., the pilot of
Bristol Fighter aircraft, and his passenger, Lieut. Da
Francis Cumin Scott, 1st Essex Regiment, were killed.
pilot and sole occupant of the other aircraft was uninju

The 1928 Cairo–Cape Town Flights.

The annual Service Flight under the command of Air V
Marshal T. I. Webb-Bowen, C.B., C.M.G., which left He
polis, on Mar. 1, arrived at Ndola on Mar. 16. Air V
Marshal Webb-Bowen's machine was wrecked when tak
off at Bwana Mkubwa, and had to be left behind at Nd
in charge of two mechanics.

The rest of the Flight arrived at Bulawayo on Mar.

His Majesty's Air Attache at Rome.

The Court Circular of Mar. 16 announced that on that
Group Capt. C. R. S. Bradley, O.B.E., R.A.F., had the hon
of being received by the King upon his appointment as
Majesty's Air Attaché at Rome.

Group Captain J. B. Bowen.

Group Captain J. B. Bowen, O.B.E., whose appointment
Headquarters 'Iraq for Technical Staff Duties is dated Mar
was born in 1883 at Newport, Cardigan, Pembroke, and e
cated at Winchester and Trinity College, Cambridge.
joined the Pembroke Yeomanry in 1910 and in January, 1
was seconded for duty with the South Wales Mounted Brig
Signal Troops. He was appointed Assistant Equipm
Officer, R.F.C., in November, 1916, and was appointed
command the Wireless School, R.F.C., with the tempor
rank of Major in March, 1917. In August, 1919, he
granted a permanent commission in the R.A.F. with
rank of Wing Commander and was posted to the Air Minis
as Deputy Director of Instruments in the Department of
Air Member for Supply and Research. In July, 1925,
was appointed Chief Instructor to the newly-formed C
bridge University Air Squadron. He is a Qualified Sign
Officer.

Squadron Leader A. Lees.

Sq. Ldr. Alan Lees, whose appointment to No. 56 (Figh
Squadron, North Weald, is dated Feb. 7, was born in
at Kott's Lane, Lancashire, and educated at Weiling
and Sandhurst. He was appointed to a commission in
Royal West Kent Regiment in November, 1914, and ser
in France. He was seconded from his regiment to
R.F.C. in August, 1915, and returned to France the follow
month. He was promoted to Captain in July, 1916. Fr
March, 1917, to December, 1918, he was a prisoner of W
in Germany. In August, 1919, he was granted a perman
commission in the R.A.F., and in 1921 he was appointed
No. 6 Flying Training School at Manston. In July, 1922,

GLOSTER
AIRCRAFT Co LTD
SUNNINGEND WORKS CHELTENHAM
GLOS.

View of Brockworth Works & Aerodrome, Glos.

CONTRACTORS TO THE BRITISH AIR MINISTRY AND FOREIGN GOVERNMENTS FOR LANDPLANES AND SEAPLANES IN BOTH WOOD AND METAL.

METAL CONSTRUCTION OF AIRCRAFT.—The Gloster Company hold a unique position as regards Metal Aircraft, their Staff having been engaged on Corrugated Metal Strip Construction since 1915.

was posted to No. 1 F.T.S. at Netheravon, and in September, 1923, he was posted to No. 45 (Bombing) Squadron, at Hinaidi, 'Iraq. He was promoted to Squadron Leader in July, 1924, and posted to No. 9 (Bombing) Squadron in January, 1927.

Squadron Leader J. J. Breen.

Sq. Ldr. J. J. Breen, whose appointment to command No. 55 Squadron, R.A.F., is dated Feb. 23, was born in 1896 and entered The Royal Irish Regiment in August, 1915. He learned to fly on a Maurice Farman biplane at Shoreham and his Royal Aero Club Certificate No. 2103, is dated Nov. 18, 1915. He was seconded to the R.F.C. in February, 1916, and appointed Adjutant to No. 32 Squadron. In March, 1916, he was posted to No. 24 Squadron, B.E.F., and served in France and Italy and was three times mentioned in Despatches. After the Armistice he was posted to the M.T. Repair Depot at Harlescott and in November, 1922, he was appointed to the Directorate of Organisation at the Air Ministry. He completed satisfactorily a course at the R.A.F. Staff College, Andover, in 1926-27, and in July if 1927 was attached to No. 24 Squadron for a refresher course.

R.A.F. SPORTS AND PASTIMES.

Rugby Football,

Royal Air Force versus Civil Service : The Royal Air Force Representative team won their first match this season on Mar. 14 at Uxbridge when they beat the Civil Service by four goals and a try (23 points) to a penalty goal and a try (6 points). The R.A.F. Central Band played before the game and during the interval. Although the practice of having a band at Rugger matches is greatly appreciated by the audience the question might arise whether, if the Pipes are not allowed to be used as a weapon against the English side in a Calcutta Cup match, ought the R.A.F. March to be used as a weapon against the Civil Service?

The R.A.F. team have improved considerably since their match against the Navy particularly behind the scrum. At full-back AC. H. R. Lawson, who usually plays wing three-quarter, was not brilliant and his fielding was rather erratic, but he was never flurried and kicked a good length with either foot. At half Mr. Odbert was able to field Sq. Ldr. Russell's passes instead of being torpedoed by them and Sq. Ldr. Russell gave several demonstrations of his famous screw kick. The three-quarter line has settled into a useful attacking machine as well as being a stubborn and effective line of defence. Among the forwards Mr. Stevens, a new R.A.F. cap, made a useful support for Flt. Lt. Chick, who has come back to the team with renewed life and energy.

The first R.A.F. try came immediately after the start, and was the result of a smart passing movement between Hodder and Bremridge and a dash down the line by Odbert who threw a high pass in to Hodder to score. Coote converted. Then the R.A.F. forwards came into action headed with some tank-like movements by G. R. Beamish. Bremridge and Massey put in some neat passing and Constantine came up behind them and took a loose pass with one hand and crossed over for Coote to place another goal. Some passing amongst the Air Force forwards was intercepted by G. Goldsworthy, the Civil Service inside left, who ran through and kicked ahead. Lawson fielded cleanly and found touch after dodging a few opponents and gai ing some ground. Some scrambling play and a lot of whistle w followed by Chick taking the ball at his feet right down the fie at top speed. Coote took over when Chick was tackled and dribbl across the line and touched down. The Civil Service began to the ball away from the scrums and S. C. Tucker broke through wi a quick "S" turn and was over the line before Lawson could bri him down.

The Civil Service improved steadily in the second half and t game was more even. A promising Air Force attack broke down wi a forward pass. Another R.A.F. attack by all the backs was crowd into touch near the flag after Odbert had taken a pass from Russ a few inches from the deck. H. R. Comerford intercepted an Force pass and made ground before he was thrown into touch Lawson. H. S. Dyer scored a penalty goal from a kick against t Air Force for offside. The Civil Service heeling improved and the Force were driven into their own twenty-five. A Civil Service forw rush was stopped near the line by Lawson and Massey started a g movement but Coote knocked on. Chick and Stevens got away but pass went wild. The Civil Service rallied well at this stage but Air Force tackling defeated them. Some hard work by the R.A forwards resulted in a clean bout of passing between the backs a a long straight run by Bremridge down the wing and round beh the goal. Coote converted.—C. M. MCA.

The R.A.F. team were:—AC. H. R. Lawson (Manston), back, D. Massey (Shrewsbury), AA. P. B. Coote (Halton), Flg. Off. F. Hodder (Andover), and Flg. Off. C. H. G. Bremridge (Sealand), thr quarter backs; Sq. Ldr. J. C. Russell (Air Ministry) and Flg R. V. M. Odbert (Worthy Down) (captain), half-backs; Flg. Off. F. Beamish (Cranwell), F-S. G. F. Cockell (Henlow), Sjt. A. C. H (Wittering), Plt. Off. H. A. Constantine (North Weald), Flt. Lt. C. Adams (Halton), Flt. Lt. J. S. Chick (Wittering), Flg. Off. G Beamish (Bicester) and Plt. Off R. J. Stevens (Worthy Dow forwards.

The R.A.F. Rugby Cup Final.

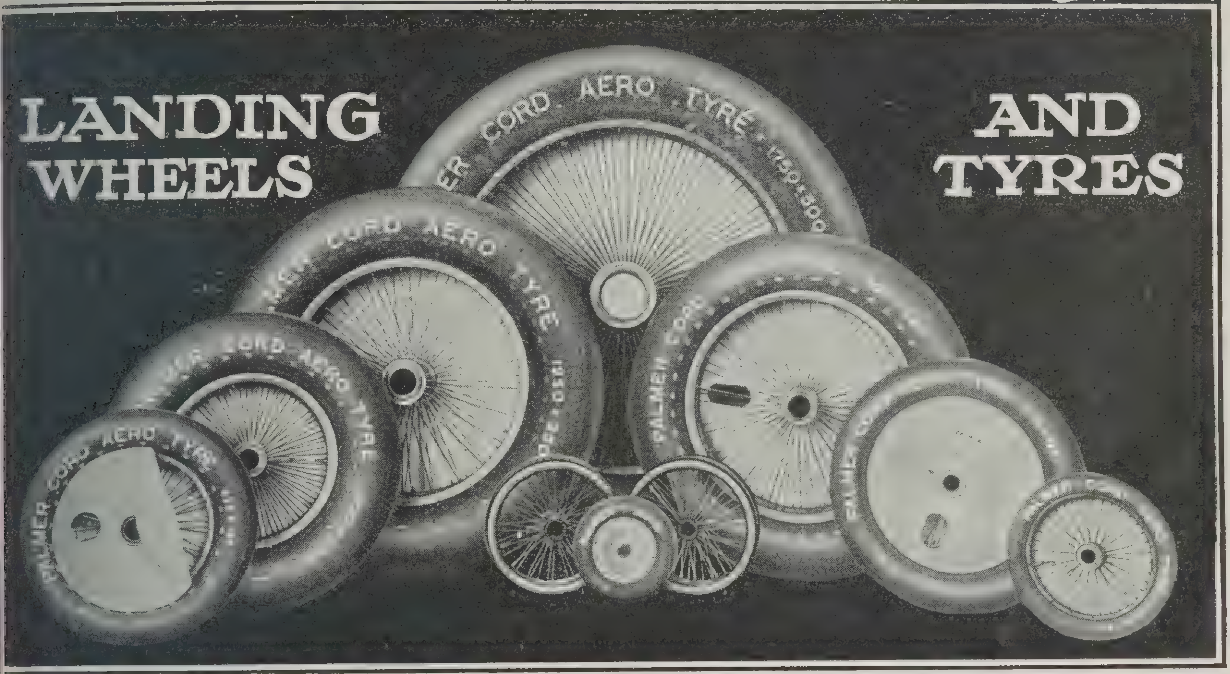
Duxford versus Worthy Down :—The final round of t R.A.F. Rugby Cup Competition at Uxbridge on Mar. 19 pr duced an exceptionally good game and a very high standa of play all round. Duxford beat the holders, Worthy Dow by a dropped goal, a penalty goal and a try (13 points) to goal and a try (8 points). The Duxford side must be one the best which has ever turned out to represent an R.A. Station. They had beaten Halton, Ruislip and Henlow in t earlier rounds and Leuchars by 27 points to nil in the sem finals. At full-back L-AC. Munslow was a trifle slow b he fielded and kicked with good judgment and it was in possible to flurry him. The threequarters were fast and th handling was far better than anything the R.A.F. represent tive threequarters have done this season. The halves work well together and kept the threequarters continually on t move. The forwards were fast and well trained and hav in AC. Maxwell, a first-class hooker who should undoubted be in the R.A.F. side. Flt. Lt. Tyrrell is to be highly co gratulated on his team.

Worthy Down fielded the same team that played so w in the semi-finals against Manston, including a reform Mr. Maclean who was quite the best individual player the field. He scored both the Worthy Down tries and w the origin and inspiration of practically every attacking mov ment. Flg. Off. Odbert supported him well at stand-off ha but although they seemed to have faster wing threequarte their team work was not quite so good as Duxford's.

Duxford pressed for the first few minu but Worthy Down got back with a spr down the wing before a Duxford threequar intercepted a short pass and found touch. Af some loose forward play Pott scored for Du ford far out on the right. The goal k failed. Worthy Down attacked and drove Du ford back onto their goal line and Macle got over for a try. The kick at goal was c allowed. Worthy Down kept up the press and a kick at goal from a penalty f short. A little later another penalty agai

NO. 45 (BOMBING) SQUADRON.—T Hockey Team which won the R.A. (Middle East) Hockey Competiti during the Unit's first year in the Co mand. In the finals, No. 45 Squadr beat No. 208 Squadron after an exciti game by 2 goals to nil. The team ar Standing (left to right), L-AC. Port L-AC. Elliot, Cpl. Kenney, C Jones, W., Sjt. Plt. Gillie and L-A Ellis. Seated, Cpl. Spillard, Flt. J. V. Kelly (Capt.), Sq. Ldr. J. Summers, M.C. (Commanding Office Flg. Off. P. R. Stroud. In front, L-A Whenlock and AC.2. Deane.

PALMER



STANDARD SIZES.

yre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
5×55	168	111.12	25.4	Central
0×60	16	111.12	25.4	Central
0×60	30	89.	31.75	Central
„	172	130.	38.09	Central
5×60	21	160.	28.	Central
„	180	150.	38.09	104/46
„	186	120.	34.92	Central
„	90	150.	38.09	Central
0×65	78	178.	44.45	132/46
„	79	178.	44.45	Central
„	100	178.	38.09	132/46
„	101	178.	31.75	132/46
0×75	21	160.	28.	Central
„	180	150.	38.09	104/46
„	186	120.	34.92	Central
„	190	150.	38.09	Central
0×75	78	178.	44.45	132/46
„	79	178.	44.45	Central
„	100	178.	38 09	132 46
„	101	178.	31.75	132/46
×100	77	178.	44.45	132/46
„	92	185.	55.	135/50
„	95	185.	55.	Central
„	99	178.	38.89	132 46

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
700×100	112	150.	38.09	Central
„	176	178.	44.45	Central
„	179	178.	55.	132/46
650×125	119	178.	55.	132/46
„	147	178.	55.	Central
„	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
„	92	185.	55.	135/50
„	95	185.	55.	Central
„	99	178.	38.89	132/46
„	112	150.	38.09	Central
„	176	178.	44.45	Central
„	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
„	162*	185.	55.	Central
„	163*	185.	66.67	135/50
„	169†	185.	55.	135/50
„	177	185.	55.	135/50
„	183	185.	55.	Central
„	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
„	174	250.	80.	Central
„	182	185.	55.	Central
„	187	220.	66.67	Central
„	201	185.	60.32	125/60

Tyre Size	Wheel No	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
„	149	185.	55.	Central
„	155	220.	66.67	Central
„	166	185.	55.	125/60
900×200	107	185.	55.	Central
„	108	185.	55.	125/60
„	128	220.	66.67	Central
„	137	250.	80.	Central
„	157	185.	80.	Central
„	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
„	136	250.	80.	Central
975×225	192	185.	60.32	Central
„	194	185.	55.	125/60
1250×250	133	250.	80.	Central
„	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
„	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
„	191	350.	150.3	Central
1750×350	193	400.	125.	Central

els Nos. 161, 162, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres. *†Wheel No. 169 is fitted with Ball Bearings.*
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(365)

Duxford was taken by Maclean, who kicked the ball a few inches fielded it, and dodging the opposition ran over near the goal for a neat solo. This was converted. This ended the scoring in the first half but the battle waged up and down the field, neither side gaining much advantage.

In the second half Duxford had the wind behind them and the forwards were getting the backs away time and again. Worthy Down had to go all out to keep their lead but their tackling was sound and their forwards were holding their own in the loose and the line-outs. The game had only about fifteen minutes to go when O'Callaghan kicked a beautiful penalty goal. From that point onward Duxford had the best of the game although Worthy Down put up a stubborn defence. Tyrrell cut through and crossed the line with a fine effort but the try was disallowed. Duxford kept the ball in the Worthy Down twenty-five for some hair-raising minutes before Philpott dropped a goal. In the last five minutes Hale-Munro scored a final try for Duxford.

The Duxford team were:—Full back, L-AC. Munslow; three-quarters, Flg. Off. R. R. Nash, Plt. Off. J. R. H. Pott, Flt. Lt. G. Y. Tyrrell, Flg. Off. T. N. Hale-Munro; halves, Plt. Off. M. G. Philpott, AC. Blennerhasset; forwards, Plt. Off. P. O'Callaghan, AC. Swannoch, AC. Clarke, Flg. Off. J. E. Clayton, AC. Yule, Plt. Off. J. Clarke, AC. Maxwell and A. N. Other.

After the match the Cup was presented to the Captain of the Duxford team by Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O., who congratulated all concerned and said that he had never watched a finer game.—C. M. McA.

Inter-Services Boxing.

The Inter-Services Boxing Association Championship took place at Halton on Mar. 14 and 15.

The Army won four out of the six finals in the Officers' Class and six out of eight in the Other Ranks' Championships. The Army also won the Boys' Team Championship. The results of the Finals were as follows:—

Boys' Team Championship.

Fly-weight.—AA. Denahay (R.A.F.) beat Boy Sullivan (R.N.) on points.

Bantam-weight.—Boy Wilson (Army) beat Boy Kentwell (R.N.) on points.

Feather-weight.—AA. Iddon (R.A.F.) beat Boy Davidson (Army) on points.

Light-weight.—Boy Barratt (Army) beat AA. Brown (R.A.F.), who was disqualified in the third round for hitting low.

Welter-weight.—Boy Brennan (Army) beat AA. Williams (R.A.F.) on points.

Middle-weight.—Boy White (Army) beat Boy Arkinstall (R.N.) on points.

Other Ranks.

Fly-weight.—Cpl. Connell (Army) beat AC. Cooper (R.A.F.) on points.

Bantam-weight.—Pte. Garland (Army) beat AC. Johnson (R.A.F.) on points.

Feather-weight.—AC. Fairclough (R.A.F.) beat A.B. Gamble (R.N.) on points.

Light-weight.—A.B. Pledger (R.N.) beat Sjt. Johnson (Army) on points.

Welter-weight.—Pte. Cromey (Army) beat L-AC. R. W. Garratt (R.A.F.) after an extra round of two minutes.

Middle-weight.—Gnr. R. A. Smith (Army) (holder) knocked out Ldg. Seaman Hughes (R.N.) in the first round.

Light-heavy-weight.—L.-Cpl. Rodda (Army) knocked out A.B. Rowles (R.N.) in the third round.

Heavy-weight.—Sign. Stewart (Army) knocked out AC. Forrester (R.A.F.) in the third round.

Officers.

Middle-weight.—Lt. Christian (Army) beat Plt. Off. McLean (R.A.F.) on points.

Light-heavy-weight.—Lt. Furse (R.N.) beat Lt. Cole (Army) on *points.*

Heavy-weight.—Lt. Courtis (Army) beat Flg. Off. Chichester (R.A.F.) on points.

Point-to-Point.

There have not been sufficient entries to justify a Royal Air Force Steeplechase Meeting this year but arrangements have been made to hold a point-to-point race for the R.A.F. during the Old Berkeley and Halton Camp Point-to-Point Meeting at Kimble on Mar. 29.

The Cadet Athletic Meeting.

The annual triangular athletic contest between Woolwich, Sandhurst and Cranwell, will be held at Queen's Club on May 5 at 15.00 hours.

No. 46 Squadron Annual Re-union Dinner.

The Annual Re-union dinner of No. 46 Squadron will be held at the Hotel Cecil, Blenheim Rooms, at 7 p.m. on Mar. 31 (Boat-Race night). Application for tickets, 25s. each including wines, tips, etc., should be made to C. J. Marchant, 91, Queen Victoria Street, E.C.4. Telephone City 1814-5. This will be the eleventh annual re-union of the Squadron and the Secretary makes a special appeal to all former members of the Squadron to turn up and keep the re-unions going.

No. 28 Squadron Old Boys' Association.

The half-yearly re-union of No. 28 Squadron Old Bo Association will be held at Slater's Restaurant, 34, Hi Holborn, on March 24, beginning at 6.30. Application tickets should be made to C. T. Hodges, 102, Camden Stre N.W.1.

AIR AFFAIRS IN PARLIAMENT.

THE AKHWAN RAIDS IN 'IRAQ.

In the House of Commons on Feb. 13, Capt. Cazalet asked Secretary of State for the Colonies what casualties the 'Iraq for sustained during the recent raids by the Wahabis; and whether Royal Air Force took any part in the various engagements?

Mr. Amery: So far as I am aware no casualties have been sustai by the military forces of the 'Iraq Government during the rec Akhwan raids. The answer to the second part of the question is the affirmative. The Royal Air Force have on more than occasion succeeded in locating the marauders and in engaging th with good effect.

FLEET AIR ARM EQUIPMENT.

In the House of Commons on Mar. 9, in reply to a question Cdr. Bellairs, Lieut.-Col. Headlam, for the First Lord of Admiralty, said that there were 135 first-line aircraft in the Fl Air Arm now, not including reserves, and the same number would available on July 1, 1928, as wastage was made good as it occurre

THE ZEIDI RAIDS.

In the House of Commons on Mar. 12, in reply to a question Lieut.-Cdr. Kenworthy, the Secretary of State for the Colon made the following statement:—The Imam of Sanaa has been occupation of parts of the Aden Protectorate for some years. P tracted negotiations have taken place for a settlement of the questi and, in 1926, His Majesty's Government despatched a mission to Sa with this object. The Imam, however, refused to withdraw from Protectorate. He was informed that, while His Majesty's Governm were anxious to secure a friendly settlement of their differences w him, they could not recognise that he had any rights whatever wit the Aden Protectorate, and they warned him that his contin occupation of parts of it would render him liable to retaliat measures. In spite of this communication, armed Zeidi forces pe trated further into the Protectorate in September, 1927, and only wi drew on being warned that air action would be taken against the Warnings were then dropped on certain towns in the Yemen that, the event of further incursions being made into the Protectorate, action would be taken against them. On Feb. 8 the Zeidis kidnap the Alawi Sheikh and a relation of the Koteibi Sheikh, both of wh are entitled by treaty to the protection of His Majesty's Governme After 48 hours' notice air action was taken against Kataba in Yen territory, which is understood to be the headquarters of these Ze forces directly responsible for the outrage.

On Mar. 14, in reply to Mr. Day, the Secretary of State for said that the Zeidi Headquarters at Kataba had been bombed on separate days and the Zeidi Headquarters at Dala on one day. Wh operations were still in progress it would not be in the pu interest to give further particulars.

SPEED TRIALS BY THE R.A.F.

In the House of Commons on Mar. 13, in reply to a question Mr. Hannon, the Secretary of State for Air said that he was una to make any statement to the House on the circumstances un which Flt. Lt. Kinkead had lost his life in Southampton Water Mar. 12. The speed trial undertaken by this gallant officer been approved by the Air Ministry who considered that speed tri of this character did serve a useful purpose in aircraft organisat for defence. An inquiry would be held to ascertain the cause of disaster. He would add that the machine and engine employed w of the same type as those which won the Schneider contest in Ven last September and that every possible precaution had, of course, b taken to reduce to a minimum the possibilities of accident in flig of this character. He was sure the House would join him in expr ing their profound sympathy to the relatives of this most gallant promising officer whose untimely death they all most deeply mourn

THE R.A.F. STAFF COLLEGE.

In the House of Commons on Mar. 13, in reply to a question Mr. Griffiths, the Secretary of State for Air said that the num of Indian Army, Royal Canadian Air Force and Royal Australian Force officers respectively who had received training in the R.A Staff College in the past three years had been: In 1925, one, one, t in 1926, one, two, two; in 1927, one, two, two. No charge was m against the Indian Government in respect of Indian Army officers trained in view of the provision of that Government of recipro free training at the Staff College, Quetta. Payments were made the Governments of Canada and Australia at the rate of £400 a y in respect of each officer under training at the R.A.F. Staff Coll and particulars of the actual receipts which did not necessarily rel to training within the year of receipt were as follows: 1925, Austra and Canada £600 each; 1926, Australia £800, Canada £879; 192 date, Australia and Canada, £479 each.

THE R.A.F. CADET COLLEGE.

In the House of Commons on Mar. 14, in reply to a question Mr. J. Baker, the Secretary of State for Air said that no cad had entered the R.A.F. Cadet College from the Dominions in 19 One Australian and one New Zealand cadet had entered in and one Australian and one Canadian cadet in 1927.

CONVERSION OF COMMERCIAL AIRCRAFT.

In the House of Commons on Mar. 14, in reply to a question Mr. Wellock, the Secretary of State for Air said that an ordin commercial aircraft could be adapted to carry bombs for a compa tively small sum but unless it were extensively reconstructed at c siderable cost it would not be of great service against an organis defence.

After flying 12,000 miles in the flying boat 'SINGAPORE' SIR ALAN COBHAM cables as follows:

DURBAN. 9th MARCH, 1928

"THE Singapore All-Metal Flying Boat landed Durban Harbour yesterday, and we, the crew, cable to express our appreciation of the marvellous performance of your craft, which has behaved perfectly, and handled with ease on every landing and take-off from the Mediterranean through rivers and lakes of the African Continent to the sea at Beira and Durban. Her speed and climb seem even better than when we left Rochester. We feel confident in the success of the Sir Charles Wakefield flight of survey round Africa.

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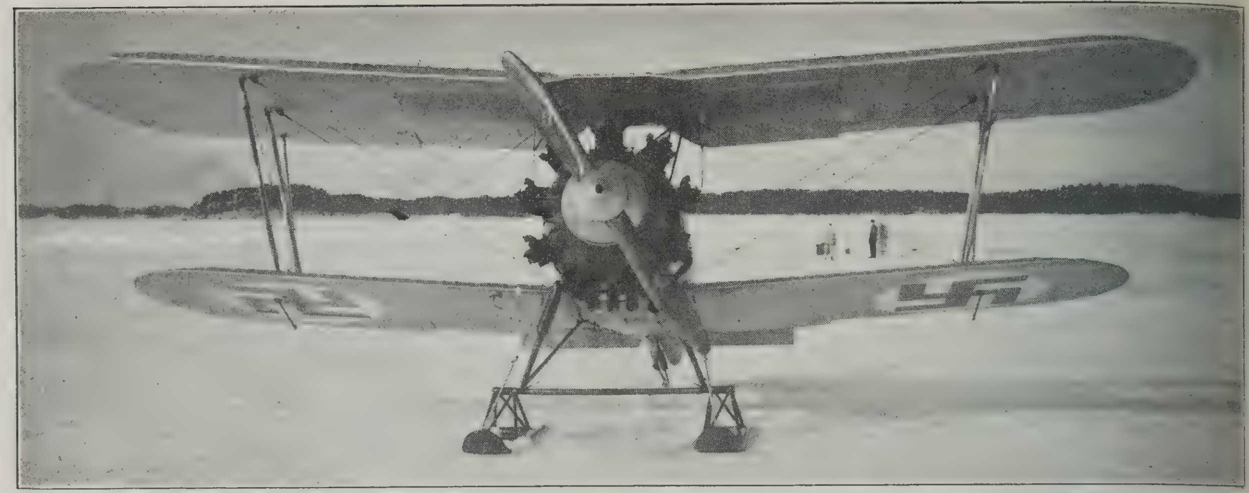


THE FINNISH PAGEANT.—The Gloster Gamecock II (Gnôme-Rhône Jupiter engine) on skis.

THE FINNISH AIR DISPLAY.

On Mar. 4 the fourth annual Finnish Air Display was held on the frozen waters of Helsingfors before an enthusiastic crowd of people.

One may presume that the Finns are accustomed to the cold, but it surely requires something more than ordinary keenness for aviation to induce such crowds of people to endure with exemplary equanimity in a biting cold wind the standing about which is the inevitable accompaniment of an air display. But the Finnish Air Force in the hands of such qualified Chiefs as Colonel Solin and Colonel Wuori has established for itself in the minds of the Finnish people a place easily superior to that of the Finnish Navy and not far short of that occupied by the Army. The propagandist efforts of the Air Defence League under the able Presidency of M. Hohenthal has also contributed not a little to this accomplishment. The League organises the Display each year and the proceeds therefrom are devoted to its efforts. But what has done most towards this achievement is the efficient development and organisation of the Air Force itself, which has stimulated the imagination of the people and awakened in them a pride in the new arm.

The Display itself was in programme similar to that of last year. It is becoming increasingly difficult everywhere to introduce any novelty into display programmes, and it will be interesting to see to what extent the public interest can be maintained in the future in the face of this fact.

The programme opened at midday with an air attack on Helsingfors in which anti-aircraft, machine-gun and gas protective units took part. This was accomplished much on Hendon lines and was well done. Two of the attacking machines were brought down and very realistically fell out of the formation when over the town.

The programme proper began at 13.15 hrs. with a parade of the various types participating, numbering twelve in all, of which the following four were British :—Gloster Gamecock II (Gnôme-Rhône Jupiter engine); Martinsyde F.4 (300 h.p. Hispano-Suiza engine); Avro 504K (130 h.p. Clerget engin and D.H. Moth (80 h.p. Cirrus engine).

It is gratifying to know that these are all recent acquir ments which indicates that in the re-equipment of its A Force Finland is purchasing British aircraft.

Thereafter followed the usual spectacular items of aer batics, destruction of balloons, bomb-dropping, smok screen and parachute descents.

A feature of particular interest was the appearance of t following three types of light aircraft :—D.H. Moth (80 h. Cirrus engine); the I.V.L. Kurki (120 h.p. Siemens-Hals engine), and the B.F.W. (Udet) Flamingo (120 h.p. Siemen Halske engine).

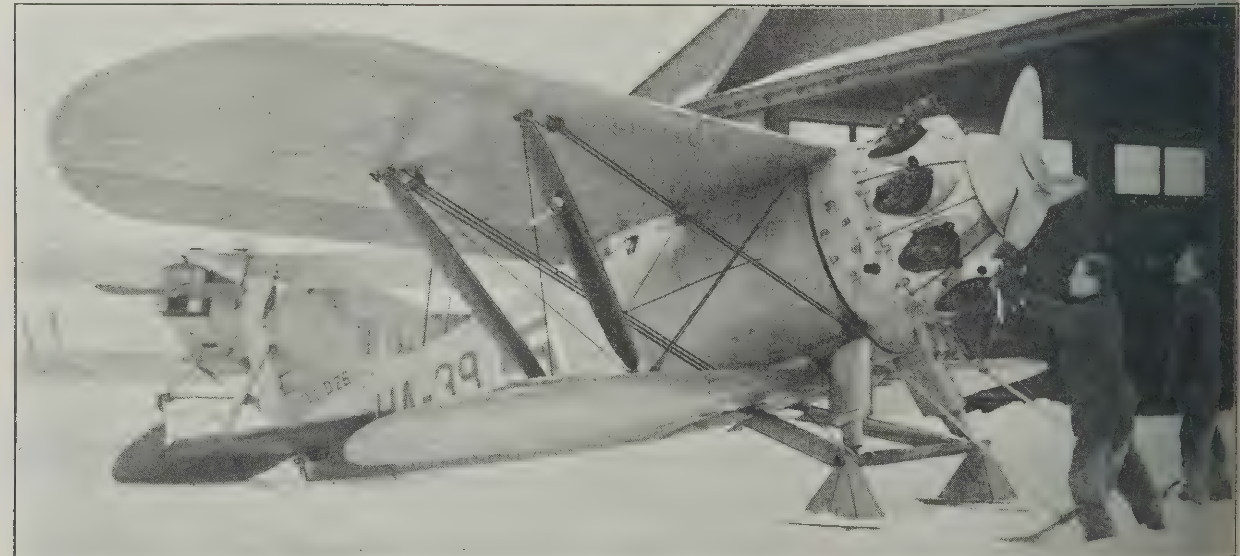
The first Moth was purchased by the Air Defence Leag from England and the Government has now acquired t licence to manufacture this type in Finland.

The single-seat fighter class was represented by the Glost Gamecock II and the Finnish I.V.L. Haukka, both fitt with Gnôme-Rhône Jupiter engines. These machin might have been shown to much better effect if they h been used for the balloon-destruction item which fell ve flat owing to the fact that the Caudron C-60 biplanes fitt with 130 h.p. Clerget engines were quite incapable manœuvring fast enough to destroy the balloons.

The Finnish Aero Company were kept very busy the who afternoon with carrying passengers in their Junkers machine making 48 flights and carrying 206 passengers at a char of roughly ten shillings per flight.

Foreign visitors included Major Björnberg and Capta Kindberg of the Swedish Air Force, Captain L. W. Charl of the Gloster Aircraft Co. Ltd., Captain C. S. Emery, w is now agent for the De Havilland Moth in Finland a Esthonia, and Lieut. Constant of the Latvian Air Force.

Conspicuous by their absence this year were Lieut.-C Wuori, Officer Commanding the Finnish Air Force, who at present in England, and Wing Cdr. R. M. Field, R.A. who, after two years' service as Air Adviser to the Finni Government, has now returned to his duties in England.



THE FINNISH PAGEANT.—The I.V.L. Haukka (Gnôme-Rhône Jupiter engine), a high performance single-seat fighter designer by Mr. K. W. Berger and built by the Finnish Government Aircraft Works, Helsingfors.

THE AUSTRALIAN DUAL FLIGHT.

e arrival of the Avian "Red Rose" (Cirrus engine) at Darwin marks the success, though not the end, of one ie pluckiest flights in the history of flying—a flight h compares as a display of determination with that of rs. Parer and MacIntosh, the second crew to reach ralia by air, after the Smith Brothers. Moreover, the d Rose" has set up two new records, in that it is the aeroplane to take a woman to Australia, and the first aeroplane to take two people there. And this is the st flight ever made by a woman. Mrs. Keith Miller Mr. W. N. Lancaster deserve the heartiest possible congratulations on their success.

haps the greatest credit is due to Mrs. Miller, for it her undefeatable enthusiasm and optimism which made ttempt possible. In spite of being deserted by asso- who were at first going to stand in on the venture, Miller went round for months trying to get support wealthy Australians, or business men associated with alia—many of whom could have easily afforded to ce the venture single-handed—and, by extracting a few ls here and an odd fifty there, she eventually extracted are amount needed to secure the machine and necessary ies.

Lancaster, by piloting the machine the whole way, y keeping it in running order, has proved himself to aviator of the first class. And the pluck and perance of both of them in carrying on after rebuilding machine in the Dutch Indies shows them to be worthy ssors of the many Australians who have made aeroal history in the past.

hopes that Australia, already stirred to enthusiasm r. Hinkler's magnificent performance, will give them eception which is their due. Certainly if Mrs. Miller's and endurance does not win for her the highest siasm, then the native Australian is less gallant than said to be.—C. G. G.

W. N. Lancaster and Mrs. Keith Miller left Croydon t. 14 in the Avro Avian "Red Rose."

ir greatest set-back occurred at Muntok on Jan. 10, in attempting to take off, they crashed. The machine adly damaged, Mrs. Miller's nose was broken, and ancaster suffered from slight concussion.

machine was rebuilt at Singapore, and on March 12 left once again for Muntok, Banka Island.

March 14 they flew from Muntok to Weltereverden, n to Surabaya, Java.

March 16 they continued to Bima, and Kupang, Timor. departure from the latter place was delayed for some wing to the boggy condition of the landing ground at n.

March 19 they flew from Kupang to Darwin, this flight ing an oversea flight of 550 miles. They were not ted, and there was nobody on the landing ground to them. They will probably remain at Darwin for a few overhauling their Avian.

MR. HINKLER IN AUSTRALIA.

On Mar. 13, Bert Hinkler spent his last and busiest day in Sydney. At 09.00 hours he made a gramophone record of the impressions of his flight. Thence he proceeded to Parramatta Park where, in the presence of 25,000 people, he was welcomed by the Mayor of Sydney, who presented him with a cheque for £200 on behalf of the townspeople. He then returned to the city for a lunch given by the New South Wales Ministry, where he was welcomed by Mr. Bavin, the Premier of New South Wales. Thereafter he was received at the Royal Automobile Sports Club, the Civic Club, the Commercial Travellers' Club, and the City Tattersall's Club.

Later he was entertained to dinner by the Aero Club and afterwards he visited two Hinkler balls.

On Mar. 14 he flew to Canberra, the new Dominion capital. He arrived at 14.00 hours escorted by two machines of the R.A.A.F., and was given an enthusiastic welcome. Returned soldiers formed a hollow square round his machine, and Mr. Hinkler was conducted through a Guard of Honour of cadets from the Duntroon Military College to a pavilion where Mr. Bruce, the Prime Minister, and other ministers and their wives, and Mr. Hinkler's mother, brother and sisters awaited his arrival.

After Mr. Hinkler had paid a call on Lord Stonehaven, the Governor-General, an official reception was held on the steps of the Parliament House. Mr. Bruce presented him with the Government's cheque for £2,000. Including this cheque the sums subscribed in Australia for Mr. Hinkler exceed £8,500.

Mr. Bruce said that though Australia was proud that the machine was entirely British the fact which most flattered Australian sentiment was that Australia should have restored to the Empire a predominant place in the possession of initiative, courage, and endurance. Mr. Hinkler, after his acknowledgment of the gift, presented a letter which he had brought from Major-General Sir Granville Ryrie, Australian High Commissioner in London, to Mr. Bruce.

In the evening he was the guest of the Commonwealth Parliament at a dinner. After the dinner Mr. Bruce presented him with a gold cigarette case engraved with the Commonwealth coat of arms.

On Mar. 18 Mr. Hinkler flew to Melbourne, landing on the Flemington Racecourse, where he was officially welcomed by Mr. Hogan, Premier of Victoria, the Lord Mayor of Melbourne, and was greeted by a crowd of between 60,000 and 70,000 people. He will remain in Melbourne a week.

An elaborate programme has been arranged in his honour, including a civic reception, a State Government luncheon, an Aero Club dinner, and gala nights at the theatres.

Mr. Hinkler intends to fly to Perth, Western Australia, after visiting Adelaide. He will reach Perth about April 1 to meet his wife on her arrival from London. His machine will be altered to accommodate a passenger, and Mrs. Hinkler will return with him to Melbourne.

NGLAND—AUSTRALIA.—Mr. W. N. Lancaster and Mrs. Keith Miller in the Avro Avian "Red Rose" (A.D.C. Cirrus engine) which they have flown from England to Australia.

THE LATEST TRANS-ATLANTIC FAILURE.

As nothing has been heard of Mr. W. G. R. Hinchliffe and the Honourable Elsie MacKay since they left Cranwell on Mar. 13, the assumption is that they have died on their way to America.

Rumours that they headed for West Africa or Persia, as published by some papers, may be neglected, because the wind when they started was blowing from the East in Central Europe and from the South in the Mediterranean areas, and Mr. Hinchcliffe would obviously not have flown against a head wind.

Everybody will sympathise with Mrs. Hinchcliffe and her children, and with Lord and Lady Inchcape.

One day last week a newspaper reported Sir Sefton Brancker as saying that he wished somebody *would* fly the Atlantic from East to West for then we should have an end to these foolish efforts,—or words to that effect. With those sentiments one agrees heartily.

There is no real reason for flying the Atlantic from East to West except the desire for notoriety (or fame, if you care to call it so) which is prompted by vanity, unless and until the attempt can be made on some type of heavier-than-air craft, not yet built, which assures safety or at any rate marks some step in progress towards safe trans-Oceanic flying.

Some day we shall have a regular trans-Atlantic air service. But its coming will not be accelerated by suicidal dashes on unsuitable aircraft.—C. G. G.

MOTHS FOR INDIA.

The Aero Club of India and Burma, which was formed in March, 1927, has just ordered twelve D.H. Moths for the equipment of four Indian Flying Clubs.

LADY BAILEY'S PROGRESS.

On Mar. 13, Lady Bailey, who is attempting to fly from London to South Africa on a D.H. Moth (A.D.C. Cirrus engine), arrived at Naples from Pisa.

On Mar. 14 she reached Catania from Naples.

On Mar. 15 she flew from Catania to Malta, and on the following day she proceeded to Homs, N. Africa, across the Mediterranean.

On Mar. 18 she is reported to have arrived at Abukir.

On Mar. 19 she flew from Abukir to Heliopolis, Cairo.

A LONDON AEROPLANE CLUB VACANCY.

Capt. F. G. M. Sparks, who since its formation has been chief instructor to the London Aeroplane Club, is leaving England for Canada shortly to take up an important flying appointment there.

This leaves a vacancy for an instructor at the London club. The Secretary of the Royal Aero Club, 3, Clifford Street, London, W.1, invites applications for the post, which must be made by letter only giving full qualifications.

NEW AVIAN PRIVATE OWNERS.

Mr. F. P. Raynham, who is now a Director of the Air Survey Co. Ltd., of London and Rangoon, has purchased an Avro Avian (A.D.C. Cirrus engine) for his own private use.

Mr. Raynham took his certificate No. 85 on a Roe biplane (35 h.p. Green engine) at Brooklands on May 9, 1911, and before the War did a great amount of flying on Avro machines of various types.

Another Avian has been supplied to Sq. Ldr. T. H. England, D.S.C., A.F.C., R.A.F.O., who is now on the Technical staff of Handley Page Ltd. This particular machine is to be fitted with the Handley Page automatic slot.

To commemorate Bert Hinkler's flight to Australia in 15½ days, Sir Charles Wakefield has presented an Avro Avian (A.D.C. Cirrus engine) to the Australian Government. In acknowledging this gift Mr. Bruce, Prime Minister of Australia, telegraphed to Sir Charles Wakefield as follows:—

> On behalf of the Government and people of Australia I have very great pleasure in accepting generous offer of Avro-Avian plane. Nothing could more fitly mark the great achievement of Hinkler. I feel sure that your gift will be an inspiration to the development of aviation in Australia.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: Harold E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Mar. 18.

Flying Time 21 hr. 20 min. *Instruction* 13 hr. 35 min. *Sol* 7 hr. 45 min. *Instruction.—With Mr. F. G. M. Sparks*—Miss Cholmondeley, Miss Fletcher, Miss Wilson, Mrs. Fraser, Messr Black, A. O. Wigzell, D. S. Schreiber, A. P. Glenny, R. Ward, F. Fisher. *With Mr. F. R. Matthews*—Mrs. Cook, Dr. Cook, Me A. O. Wigzell, J. A. Crane, L. Rowson, H. Lane, S. Hansel. *Solois* Messrs. R. Sanders Clark, C. E. Murrell, H. B. Michelmore, P. H H. M. Samuelson, W. L. M. O'Connor, O. J. Tapper, B. B. Tu K. V. Wright, J. A. Brewster, J. H. Saffery, G. C. Bonner, H. Solo Lord Douglas-Hamilton. *Passenger Flights.—With Mr. Sparks*- N. F. Shelley. *With Mr. A. R. Ogston*—Mr. E. G. Denton.

Flying at Stag Lane on Friday and Saturday was curtailed account of the R.A.F. Display at Hendon before the King Afghanistan.

Presentation to Mr. F. G. M. Sparks.—Mr. Sparks is giving up post as Chief Pilot Instructor of the Club early in April, havi accepted an appointment in Canada. Mr. Sparks has been the Chi Pilot Instructor of the Club since it started, and it is no exagger tion to say that he has turned out more pupils than any other Cl Instructor.

In view of the very valuable services rendered to the Club by M Sparks, the Committee think that the members would wish a present tion to be made to him before his departure as a mark of the appreciation of his efforts on behalf of the Club. It has therefo been decided to invite donations limited to 10s. and members wishi to subscribe to the presentation are requested to communicate wi the Secretary of the London Aeroplane Club, 3, Clifford Street, Londo W.1.

Mr. S. L. F. St. Barbe has been granted three weeks' leave to ena him to make a flight to Constantinople and back with Mr. McClure in the latter's private Moth. During his absence the C have secured the services of Mr. F. R. Matthews, of the De Hav land Company.

Visit of the King of Afghanistan to Croydon.—In response to invitation of the Air Council, the Club will send three D.H. Moths Croydon on Mar. 21 in charge of Mr. F. G. M. Sparks. The Cl will be represented by the following members:—Mr. O. J. Tapp Mr. F. R. Matthews, Miss Winifred Spooner, and Mr. H. Sutton.

In addition to the three Club machines the following members also attend in their privately-owned Moths:—Mr. G. R. Mert Mr. N. H. Jones, and Capt. S. J. Burt.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Mar. 17.

Flying Time 16 hr. 40 min. *Instruction* 11 hr. 20 min. *Soloi* 3 hr. 10 min. *Passenger Flights* 1 hr. 20 min. *Tests* 50 min. *Instr tion.—With Mr. Baker*—Messrs. Cohen, Stross, Harber, Eills, Tweeda Benson, Wilson, Harrison, Mills, Gort, Glack, Watson, Allott, Tayl Weale, Davison, Crosthwaite, Nicholson, Miss Hill, Miss Emery. *W Mr. Cantrill*—Messrs. Brooking and Weale. *Soloists (under instr tion).*—Messrs. Hall, Gort and Cohen. *Pilots.*—Messrs. Twemlow a Lacayo. Eight passengers were given flights, the pilots being Mess Goodfellow, Twemlow and Baker.

Capt. Lamplugh came down at the week-end and inspected a approved the aerodrome under construction at Blackpool for t Northern Area Pageant.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Mar. 18.

Flying Time 10 hr. 40 min. *Instruction* 1 hr. 45 min. *Soloists* min. *"A" Pilots* 5 hr. *Tests* 1 hr. *Passengers* 2 hr. 30 m *Instruction.—With Mr. Parkinson*—Messrs. Runciman, Horn, Wel *Soloist.*—Dr. Alderson. *"A" Pilots.*—Mrs. Heslop, Messrs. R. Thompson, C. Thompson, N. S. Todd, F. L. Turnbull, R. M. Stol A. Bell.

The snowstorm of last week stopped all flying (*and* road tra in the district), the machines not leaving the hangars except some tests for weather and about an hour flying on Friday. All t rest for the week being made on Sunday, when it was clear rather too windy for all but the more experienced pilots.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending Mar. 17.

Flying Time 5 hr. 35 min. *Instruction* 3 hr. 40 min. *Soloi* 1 hr. 55 min. *Instruction.—With Mr. Beck*—Messrs. Clayton, Colli Cooke, A. Crowther, R. K. Lax, Ostler, G. Thompson. *Soloists* Messrs. Clayton and Lister. *"A" Pilots.*—Mr. I. Thomson.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending Mar. 10.

Flying Time 15 hr. 29 min. *Number of members given Dual struction (by Flt. Lt. Rose)*, 7. *Advanced Dual (with Flt. Lt. Rose), Soloists*, 9. *Total number of Passengers taken on Club machines,*

Mr. E. D. Wynn was launched solo on Sunday and put up a ve good performance.

In spite of the prevalence of fog, which made flying impossi

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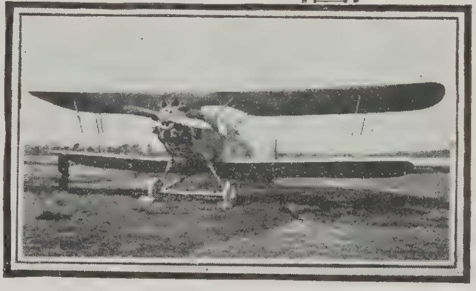

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until late in the day, 10 hr. 44 min. was put in by the two Moths during the day, which constitutes a Club record which we hope to considerably exceed during the summer.

Messrs. Bartlett and Bathurst of the Bristol Club recently paid us a visit on a Moth.

Report for week ending Mar. 17.

Flying Time 15 hr. 55 min. *Number of members given Dual Instruction (by Flt. Lt. Rose),* 9. *Soloists,* 7. *Total number of Passengers taken on Club machines,* 9.

In spite of a strong wind and snowstorms we managed to put in nearly 5 hours' flying on Sunday.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Mar. 18.

Flying Time 26 hr. 30 min. *Soloists* 9 hr. 10 min. *Dual* 13 hr. 25 min. *Passenger Flights* 2 hr. 55 min. *Tests* 1 hr. *Instruction.—With Flt. Lt. Swoffer,* 20. *Passengers.—With Flt. Lt. Swoffer,* 4. *Soloists,* 10. *Passengers.—With Mr. Kirby,* 1.

Mr. Richardson made his first solo on Tuesday and made further successful flights on Wednesday and Thursday.

Mr. Baynes successfully did all his tests on Saturday for his "A" Licence.

The Suffolk Aeroplane Club.

[Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Mar. 19.

Flying Time 8 hr. 15 min. *Instruction.—With Mr. Lowdell*—Miss Edwards, Miss Creasy, Dr. Dunn, Messrs. R. Brown, F. Jolly, C. Hanson, H. Billinton, T. Marriage, F. Verney, G. Smith. *Soloists.*—Dr. Jas. Sleigh, Messrs. H. Billinton, S. Schofield, R. Brown, F. Jolly, C. N. Prentice.

THE "ON TO HADLEIGH" RALLY.

All aircraft arriving at Hadleigh aerodrome on the morning of Easter Sunday, Apr. 8, for the purpose of taking part in the Air Display on Easter Sunday and Monday, organised by the Suffolk Aeroplane Club, will be regarded as competing in the "On to Hadleigh" Rally.

This must not be regarded as an Air Race in the true sense of the word, but rather the prizes—£10 first, £7 10s. second, and £5 third—must be regarded as a bonus given by the Club to competitors in return for their assistance at the Display, while at the same time it will add a certain element of sport to the arrival of visiting aircraft.

Pilots who have been at Lympne on Good Friday and Saturday for the Cinque Ports Meeting are invited to make a race between themselves, while competing in the general Rally.

The prizes will be awarded to the pilots who obtain the highest number of marks based on a simple handicap formula, which takes the distance flown in a straight line from a named point of departure to Hadleigh as a basis.

Zero hour will be 11.30 a.m. The distance in miles flown will be divided by the number of minutes before or after zero hour that pilots cross the finishing line on the aerodrome in flight. The result of this calculation will be the marks obtained by each pilot. If two pilots tie, the one who has made the longest flight will be the winner. In the event of a dead heat by two pilots who have covered an equal distance, first and second, or second and third, prizes will be divided as the case may be.

Any pilot observed to be cruising about in the vicinity of the aerodrome will be disqualified.

Thus, pilots flying to Hadleigh from all parts of England have an equal chance of sharing in the bonus, and all types of aircraft may compete.

Entries stating points of departure, registration mark of machine and the intention to take part in the Display on Easter Sunday and Monday should be forwarded as early as possible so as to reach the Hon. Secretary of the Suffolk Aeroplane Club not later than Mar. 31.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Mar. 17.

Flying Time 17 hr. 25 min. *Instruction* 9 hr. 25 min. *Soloists* 5 hr. 50 min. *Passengers* 2 hr. 10 min. *Cross-Country Flights.*—Mr. Downes-Shaw and Mr. Jopp to Yelverton. Mr. Hopper and Mr. Roberts to Yeovil. *Instruction.—With Mr. Bartlett*—Messrs. Newman, B. L. Bathurst, T. H. Clarke, Kennan, Major Hume, Messrs. Girdlstone, Tanner, Garrett and Downes-Shaw. *Instruction.—With Mr. Tratman*—Mr. Walwin. *Soloists.*—Messrs. Clarke and Arnold. *"A" Pilots.*—Messrs. Jopp, H. C. H. Bathurst, Tratman and Downes-Shaw. *Passengers,* 2.

Mr. Downes-Shaw flew to Yelverton with Mr. Jopp and returned in the afternoon. Mr. Hopper took Mr. Roberts with him to Yeovil where they stayed the night. Both journeys were made through snow showers. We hope that members of other Clubs will attend the Pageant on May 5. R.Ae.C. and affiliated Club members will be admitted free on production of official badge.

The Bombay Light Aeroplane Club.

On Jan. 25, at an informal meeting held at the Taj Mahal Hotel, Bombay, it was resolved to form a Bombay Light Aeroplane Club.

A provisional Committee consisting of the Hon. J. L. Rieu, Revenue Member, Government of Bombay, Sir Ibrahim Rahimtula, Sir Fazulbhoy Currimbhoy, Sir Victor Sassoon, Sir Phiroze Sethna, Mr. Santidas Askuran, Mr. M. H. Fenn, Mr. Sayer and Mr. Eastley, with Mr. E. A. Alton as Secretary of the Club and Major Impey as ex-officio member was appointed to draw up rules and regulations and work out details.

The Hon. Mr. Rieu, who was in the chair, in opening the proceedings, said that the Aero Club of India and Burma which was founded in March, 1927, by members of the Legislative Assembly on the initiative of Sir Victor Sassoon had succeeded in forming light aeroplane clubs in Delhi, Allahabad and Calcutta, while one already existed in Karachi. He added that the efforts of the Aero Club of India and Burma, which to a considerable extent had received the approval of Government, were largely concerned with teaching young Indians to fly and all clubs affiliated to the Aero Club of India and Burma were being run on the same principles. Sir B. N. Mitra inaugurated a scheme last Autumn for training young Indi in England by means of scholarships for the purpose of becom fully qualified aviation specialists. The present plan only allow for training of ten young Indians per annum and he hoped that t scheme would be very substantially enlarged.

Sir Victor Sassoon said that aviation was as important to the p gress of India as road development. If Indians want to take th place in commercial aviation they should lose no time in get as many of their youths as possible trained in this industry.

Major Impey said he was satisfied that the Government had ch about the only way of beginning the Indian aircraft industry deciding to subsidise light aeroplane clubs and he urged every pe who was interested in flying to assist the club in all possible wa

The Chairman in his concluding speech announced that anoth meeting would be held to consider the report of the provision committee.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending Mar. 18.

Flying Time 76 hr. 40 min. *Instruction—Dual* 24 hr. 45 min.; *So* 36 hr. 10 min. *Other Flying* 15 hr. 45 min.

During the week the activities of the School have been somewh increased although on Friday and Saturday the R.A.F. display f the benefit of the King of Afghanistan somewhat interfered with t normal routine.

Six new Moths were tested during the week and one set out on delivery flight to Italy.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending Mar. 14.

Flying Time 20 hr. 15 min. *Dual* 12 hr. *Solo* 8 hr. 55 mi *Dual.—With Mr. H. D. Davis*—Messrs. McCabe, Habsburg, Latte Liniker, Hamilton, Hill, Whitard, Col. Rice, Dr. Wall, Dr. Forcyth *Solo.*—Dr. Wall, Messrs. Lattey, Hill, Anderson, Hamilton, Linike Crabtree, and Jonassen.

Messrs. Anderson, Crabtree, Liniker are now flying AS from t front seat.

On Tuesday Mr. McCabe had engine failure owing to a brok inlet valve. He put up a very good show and landed his machi side-wind.

Mr. Hamilton was launched "Solo" after only 3 hr. 15 min. du

Mr. Lattey has now completed the air tests for his "A" Licenc making five "tickets" since Jan. 1, 1928.

The Perth (W.A.) Flying School.

The Perth Flying School is operated by West Australian Airwa and uses D.H. Moths (Cirrus engines).

From the date of opening on Apr. 19, 1927, to Jan. 12, 1928, t total flying time amounts to 276 hr. 35 min., of which 231 h 30 min. dual and 36 hr. 45 min. solo flying was put in by pu members. The remaining 8 hr. 20 min. was flown by pilot members

Fifteen members have passed the tests for their "A" licences and number of other members are practically ready for test.

On Jan. 12 there were 17 pupil members in training with fo on the waiting list.

THE STATION LIBRARY

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every R.A.F. Station Library.

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C. G. Grey and L. Bridgman. £2 2s.

ELEMENTARY AERONAUTICAL SCIENCE.
I. B. Hart. 7s. 6d.

THE WAR IN THE AIR (Official History).
Sir Walter Raleigh. £1 1s.

BASIC PRINCIPLES OF AIR WARFARE.
Squadron Leader. 7s. 6d.

AERIAL PHOTOGRAPHY.
Part I. Optics and Part III. Practice and Application. (2 vols.) 3s. 6d.

THE OLD FLYING DAYS.
C. C. Turner. £1 5s.

LETTERS OF A FLYING OFFICER.
R. Stuart Wortley. 8s. 6d.

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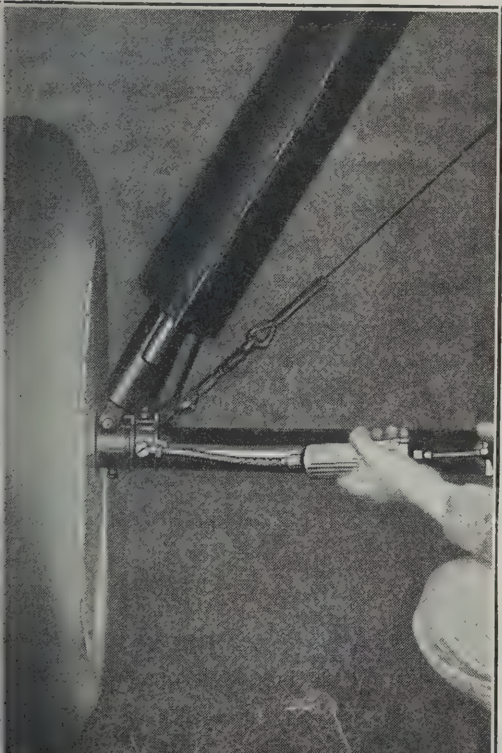

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ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 5; Monday, 15; Tuesday, 18; Wednesday, 17; Thursday, 16; Friday, 19; Saturday, 21.

IMPERIAL AIRWAYS LTD. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 42, passengers 267, freight 15 tons.
AIR UNION :
Paris—London: Machines 28, passengers 79, freight 14 tons.
K.L.M. :
Amsterdam—Rotterdam—London: Machines 14, passengers 51, freight 4½ tons.
SABENA :
Brussels—London: Machines 12, passengers 8, freight 1¼ tons.
DEUTSCHE LUFTHANSA AG. :
Amsterdam—London: Machines 12, passengers 21.
PRIVATE :
Machines 3, passengers 3.

Total number of trips by British Machines, 45, carrying 270 passengers. Foreign Machines, 66, carrying 159 passengers.

COMPARATIVE FIGURES.

Week ending Mar. 17 :
Machines, 111; Passengers, 429; Crews, 210; Total personnel, 639.
Corresponding week, 1927 :
Machines, 70; Passengers, 284; Crews, 116; Total personnel, 400.
Corresponding week, 1926 :
Machines, 94; Passengers, 262; Crews, 116; Total personnel, 378.
Corresponding week, 1925 :
Machines, 74; Passengers, 200; Crews, 90; Total personnel, 290.
Corresponding week, 1924 :
Machines, 98; Passengers, 255; Crews, 166; Total personnel, 421.
Corresponding week, 1923 :
Machines, 71; Passengers, 234; Crews, 122; Total personnel, 356
Corresponding week, 1922 :
Machines, 50; Passengers, 129; Crews, 84; Total personnel, 213
Corresponding week, 1921 :
Machines, 44; Passengers, 168; Crews, 62; Total personnel, 230.

Croydon Notes.

Croydon is naturally interested in the announcement made by Sir Samuel Hoare in the House of Commons concerning the imminent beginning of an Imperial Airways service right through from London to Delhi.

The general unofficial opinion seems to be that it will take rather longer than the announcement suggests, to make any sort of a start with such a service, if only for lack of *matériel.* The two Short Calcuttas are doubtless destined to play some part in this service, but it looks as though Imperial Airwa existing fleet of machines in Europe will be very fully oc pied during this year dealing with the normal growth of European traffic.

The third of the twin-engined Fokkers, H-NAEF, is n running on the K.L.M. lines. The interior of the cabin this machine has been given a remarkably spacious and appearance. The cabin itself is lined in that curious sil gray wood called, it is believed, "silver maple," and lin black. It has been provided with a pair of curtains ac the cabin about half-way along the length. This division the length makes the cabin look much larger than it rea is, and the light colour of walls adds greatly to this effe

Preparations are being made for a visit to Croydon Wednesday of the King of Afghanistan, who is to be tak for a flight on an Imperial Airways machine. Practically whole of the Department of Civil Aviation visited the ae drome on Friday last to make the necessary arrangeme for this Royal visit. The difficulty of fixing red carpets solid concrete stairways caused them some perturbation, a the irreverent suggestion of one looker-on that they sho try Croid was not favourably received.

Visitors who peep into the works of A.D.C. Aircraft Ltd. present may see large numbers of Curtiss OX-5 engines the process of packing. This unexpected activity is a res of the American boom in Civil Aviation. Curtiss OX engines are in great demand in the United States for use the smaller and cheaper types of Civil machine, and Ameri surplus stocks of these engines are running very low. So enterprising American buyer is therefore importing part A.D.C. Aircraft's large stock.

Surrey Flying Services are now settled—so far as th machine accommodation goes—in the eastern half of A.D.C. sheds, which have been surrendered by A.D.C. A craft Ltd. to the Air Ministry. Here they have an entra of their own from the Croydon by-pass, and their post advertising joy-rides come within the ken of a much lar public than ever entered the old aerodrome premises. Th new position ought to bring in a good deal more busin than was to be expected on the old site.

THE INDIAN AIR ROUTE.

The main details of the new agreement between the Ministry and Imperial Airways for the operation of an line between London and Delhi have, it is reported, now b

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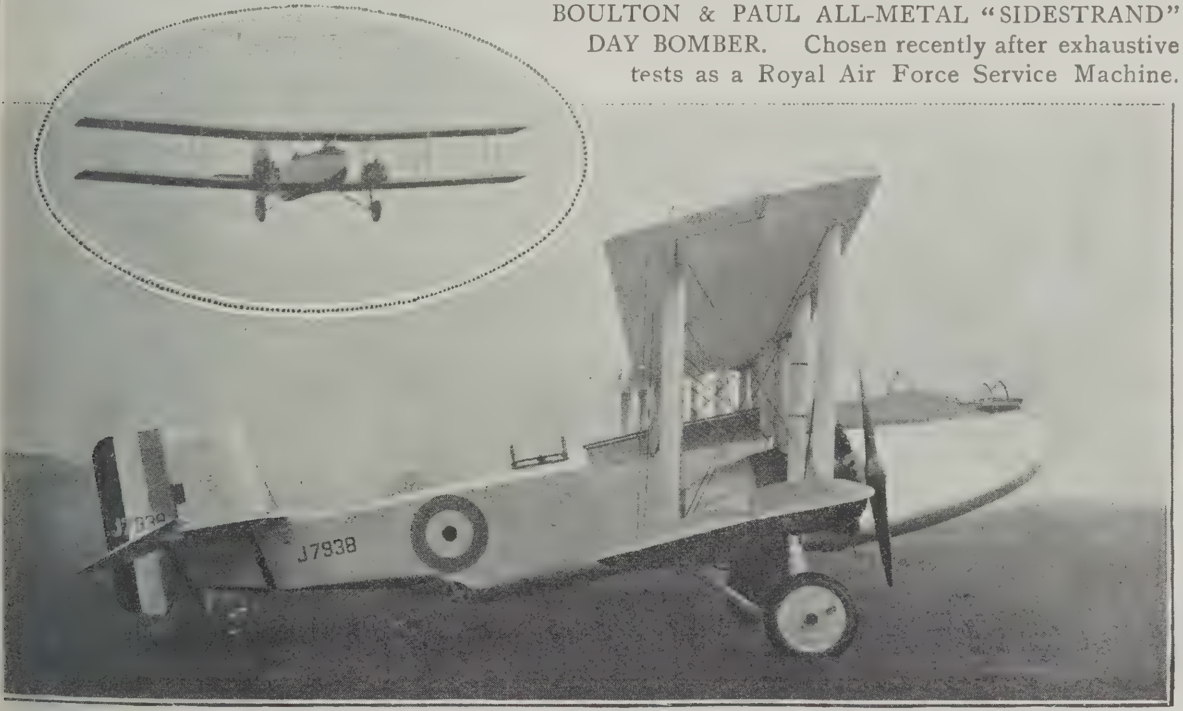

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settled. The subsidy agreement now in force provides for a total subsidy of £1,000,000 spread over 10 years ending in 1934

The new agreement extends until 1939, giving a further five years of Government support, and provides for an increased subsidy for the extended service and for the necessary Government assistance in the organisation of the route, and any diplomatic negotiations which may be required before it can be operated.

No information as to the scale of the new subsidy is available. From the fact that this year's Vote for Civil Aviation shows an increase of £19,000 for subsidies, whereas in the ordinary course the subsidy payable to Imperial Airways during the next financial year would decrease by a somewhat larger amount it seems that a total of between £40,000 and £50,000 will be spent during the next twelve months on the preparations for this service.

ITALIAN AIR LINES.

According to the official *Bolletino dell' Aviazione Civile* for February 1928 the following Italian civil air lines were in operation during January :—

Venice—Trieste. Operated by the Società Italiana Servizi Aerei. One service each way daily.

Genoa—Palermo, via Ostia (Rome) and Naples. Operated by the Società Anonima di Navigazione Aerea. One service each way daily.

Brindisi — Athens — Constantinople. Operated by the Società Anonima Aero Expresso Italiana. One service each way per week.

Rome—Venice—Vienna. Operated by the Società Transadriatica in conjunction with the Oesterreichische Luftverkehrs A.G. Daily service each way.

Tirana—Scutari (Albania). Operated by the Compagnia di Navigazione Aera "Adria Aero Lloyd." One service weekly (Mondays) each way.

Tirana—Koritza (Albania). Operated by "Adria Aero Lloyd." Two services (Wednesdays and Saturdays) each way weekly.

Tirana—Valona (Albania). Operated by "Adria Aero Lloyd." One service weekly each way.

AN ITALIAN AIR TRAVEL AGENCY.

During the month of April the Compagnia Nazionale Aeronautica, of 23, Via Sistina, Rome, is opening an Air Travel and Tourist Agency in the Piazza Colonna Arcade, the busiest point in the capital. The opening of the agency will coincide with the inauguration of the Littorio Airport, a new civil aerodrome open to international air traffic, which is owned by the same company.

RECENT FOKKER PURCHASES.

The Swedish Government has purchased a series of Fokker C-V two-seat reconnaissance biplanes fitted with Jupiter engines.

The Det Danske Luftfartselkab, the only Danish subsidised civil aviation company, has decided to augment its fleet with a number of Fokker F-VII eight-seater monoplanes with Jupiter engines.

The Polish Government has purchased a number of Fokker F-VII eight-seater monoplanes fitted with 450 h.p. Lorraine-Dietrich engines for use on the Polish air lines.

D. NAPIER AND SON, LTD.

The Directors of D. Napier and Son, Ltd., announce that their Annual Report, which will be issued shortly, will show that the net profits for the year ended Sept. 30, 1927, amoun to £169,036 12s. 9d.

They have decided to recommend at the forthcomi Annual General Meeting, that a final Dividend of ten cent., less Income Tax, be paid on the Ordinary Shar making fifteen per cent. less Income Tax, for the year, a that £50,000 be transferred to General Reserve.

They also give notice that the Ordinary Share Trans Books will be closed from Mar. 27 to Apr. 10, 1928, both d inclusive.

Also that the eight per cent. Non-Cumulative Preferer Share Transfer Books will be closed from Mar. 21 to 1928, both days inclusive.

CONDOR ENGINES IN AFRICA.

The following cable has been received by Rolls-Royce L from Sir Alan Cobham who is engaged on a survey flig round Africa on the Short Singapore (two 650 h.p. Rol Royce Condor engines) :—

Arrived Durban yesterday congratulations and thanks on sup performance of the two Rolls-Royce Condor engines fitted in Short Metal flying-boat engines have just completed one hundred fifty hours without overhaul on flight through Central Africa despite the varying climatic conditions such as heat of the Su and thin atmosphere of high altitude lakes have run without fa since we left Rochester we are--all confident and happy in reliability of the Condors for the return home via West Coas Cobham.

MORTGAGES AND CHARGES.

Short Brothers (Rochester and Bedford) Ltd.—Debenture da Mar. 2, 1928, to secure £30,000, charged on certain lands and buildi in Rochester and the company's undertaking and property, pres and future, including uncalled capital. Holder: H. O. Short, S plane Works, Rochester.

PERSONAL NOTICES.

Deaths.

JOUBERT.—At Harrismith, O.F.S., South Africa, on Mar. 12 (result of aeroplane accident), Dr. S. W. Joubert, beloved husband Kathie W. Fisher.

MUMFORD-MATHEWS.—At Manston, on Mar. 14, as the result a collision in the air, Horace James Joseph Mumford-Mathews, Off., No. 2 (Army Co-operation) Squadron, R.A.F.

Mr. Mumford-Mathews entered the R.A.F. with a S.S. comn. November, 1925, and after a course of flying training at No. 1 F.T Netheravon, was posted to No. 2 (Army Co-operation) Squadron Manston.

Forthcoming Marriages.

MEAGER—BREWER.—The marriage arranged between Capt. Geo Francis Meager, A.F.C., and Betty Romilly, only daughter of and Mrs. Griffith Brewer, of Little Burvale, Walton-on-Thames, take place at the Brompton Oratory on Apr. 28.

WELLS—YOUNG.—A marriage has been arranged, and will t place at the Church of the Holy Spirit, Nice, on Mar. 26, betw Sq. Ldr. John K. Wells, A.F.C., R.A.F., Research Department, W wich, and Elizabeth Dalway, youngest daughter of the late Rob Evans Young, of Ottawa.

Marriage.

SUTTON—DE LA RUE.—On Mar. 17, at the Church of the H Trinity, Sloane Street, by the Rev. Canon Sutton, C.B.E., and Rev. C. Cheshire, Wing Cdr. Bertine Entwistle Sutton, D.S.O., O.B. M.C., to Margaret Griselda, only daughter of Alexander Wedderbu K.C., C.B.E., and widow of Stuart de la Rue.

Births.

BUTCHER.—On Mar. 16, at 100, Cholmley Gardens, West End Gre N.W.6, to Constance Cordelia, wife of Sq. Ldr. F. L. C. Butcher daughter.

COLLIER.—On Mar. 18, at a nursing home, to Mary, wife of Lt. A C. Collier, R.A.F.—a son.

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HE AEROPLANE—MARCH 28, 1928.

THE AIR DEBATE.—II.

HE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 13. SIXPENCE WEEKLY.

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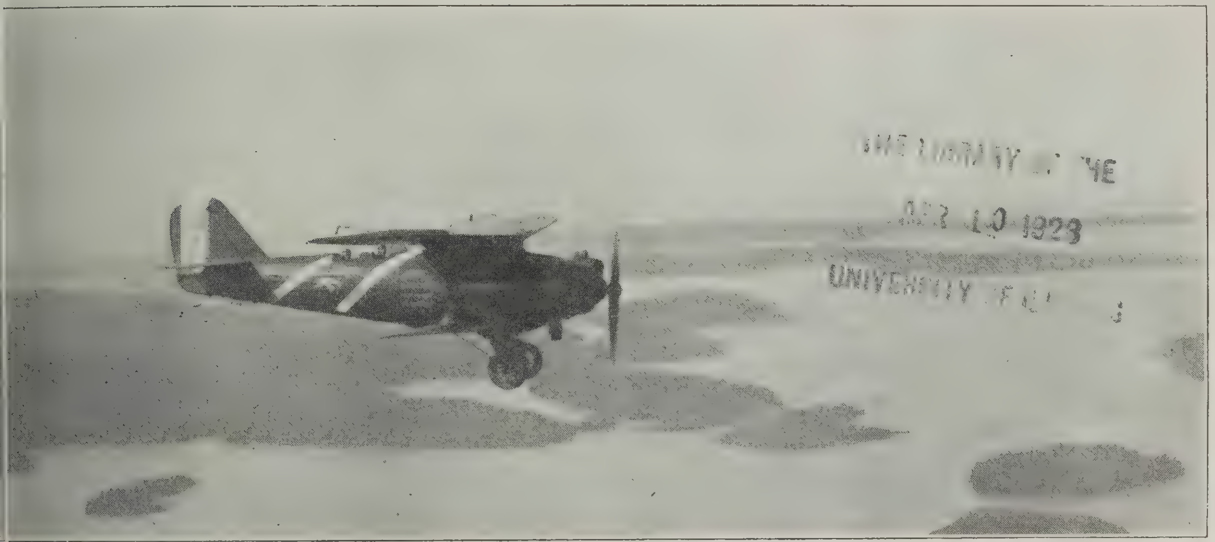
(Goldsmith.)



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LOBE TROTTERS:—Capt. Costes and Lieut. Le Brix on their Breguet XIX (500 h.p. Hispano-Suiza engine) n route from South to North America, flying over Gatun Lake, Panama. They have flown from Paris to San Francisco by way of Africa, the South Atlantic and South, Central and North America.

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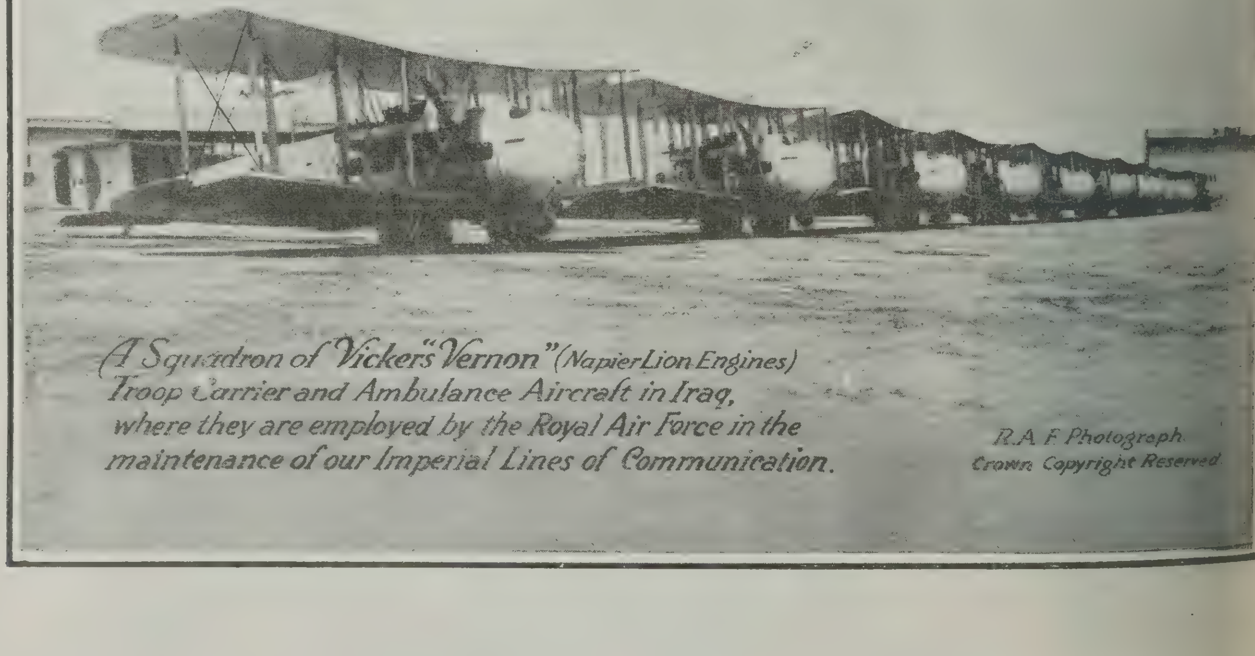

A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph.
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AR. 28,
1928.

THE AEROPLANE

Incorporating
Aeronautical Engineering

VOL. XXXIV.
No. 13.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON THE SECOND AIR DEBATE.

Mar. 20 the Report Stage of the Air Estimates was d. The gist of each speech is given hereafter with nts thereon in brackets :—

Cdr. J. M. Kenworthy (Hull, Labour), in accord with rious formalities of the House, begged to move to re- e Air Force by 100 men in order to give the Secretary te an opportunity of answering various questions put in the Committee stage. He added to those ques- on his own account by asking who was responsible defence of merchant ships at sea against aircraft, er it was a matter for the Admiralty or the Air ry and what arrangements had been made to meet reat?

C. L'Estrange Malone (Northampton, Socialist) ed the movement.

V. A. Cazalet (Chippenham, Unionist) said that he en something of the work of the R.A.F. in 'Iraq and d that maintaining law and order by any other means have cost us many additional millions of money and lives. Referring to Naval warfare he said that the of attack by aeroplanes was generally admitted to the power of defence. Anti-aircraft guns were inade- protection. Using them was like trying to shoot a ith a rifle on a cloudy day. In the United States a ittee of Investigation had said :—

> result of the experiments it is the opinion of the Committee der proper conditions aeroplanes can put out of commission any naval craft afloat. It will be difficult, if not impossible, any type of naval craft of sufficient strength to withstand tructive power of the largest bombs which aeroplanes may to carry from a shore base or sheltered harbour.

erts said that our Fleet to-day would be incompetent ect our food supplies against an air attack on vessels g supplies.

vanted to know :—What experiments we had made with screens? What was the power of the latest bombs inst the latest armament? Whether a mishit by a might do as much damage as, or more than, a direct What was the effect of a bomb dropped within fifty of the propellor of a battleship?

emarked that an aeroplane might cost £700 or at the 7,000, while a battleship costs nearly a thousand times ch. [Capt. Cazalet evidently does not know that a seat war machine may cost something in the neigh- od of £4,000 with full equipment, and that some of the craft must cost something like £40,000. Still, his nt as against the cost of warships holds good.]

eminded the House that we spent £40,000,000 on our efore we spent a single pound to find out which was st surface with which to cover them.

the supply of pilots, he suggested that every machine Imperial Airways should carry two trained pilots, dding to the safety of the passengers and providing or war use. [When will hon. Members learn that the ir-line 'bus-driver is the least likely of all pilots to be in time of war for anything other than transport ?]

rgued that commercial aviation would never be a success in this country and that people would always prefer to travel by train from London to Edinburgh rather than go by air. [Here one believes he is wrong. Why spend all day in a train when the journey could be made in greater comfort in a reasonably high-speed aircraft in about three hours?]

He stated that aviation was of vital importance in the development of certain parts of the Empire where it was uneconomic to lay down roads or railways for small communities. He quoted one settler in West Africa who said that aeroplanes were a definite economy in the management of his estate because he could get to Nairobi in 40 minutes instead of 8½ hours. [Herein, of course, he is perfectly right.]

He pleaded for judicious and generous treatment of Civil Aviation by the Secretary of State.

Sq. Ldr. F. E. Guest (Bristol, Liberal) said that the Secretary of State would find a very willing House behind him if he asked for more cash, or if, instead of that, he tried to persuade the Cabinet to rearrange the expenditure on the Fighting Services.

On the subject of Civil Aviation he reminded the House that the Chancellor of the Exchequer (Mr. Churchill), when in 1920 he was responsible for the Air Ministry, put down £1,000,000 a year as reasonable for Civil Aviation. He himself, in 1922 [as Secretary of State for Air], found it was impossible to produce a programme which involved more than £420,000, but six years later Civil Aviation was only to be given £260,000. Altogether in the last nine or ten years this country had not spent more than £1,750,000 on Civil Aviation.

He said that if the Director of Civil Aviation and the Secretary of State had great policies boiling in their minds, and if the Chancellor of the Exchequer stopped them, then, when the House had thoroughly grasped the situation it would come to the support of the Secretary of State.

He then proceeded to quote German and French figures for mileage and passengers. [These are obviously not comparable, because the geographical positions are so different. One quite agrees that the British Empire as a whole should have air lines which compare with those of Germany and France, but if the Empire is going to have them, then the Empire must pay for them. All the expense should not come out of the pocket of poor little English John Citizen.]

Continuing, he said that from the point of view of Imperial transport Croydon ought to be in Egypt. [Not unless Egypt belongs definitely and irrevocably to England.]

Referring to the geography of the Empire, he strongly advocated the development of seaplanes, partly for direct communications and partly to link up with shipping services. He wanted to see a seaplane base at Southampton, under the auspices of the Department of Civil Aviation. [Where would the lines go, seeing that the French object to our aircraft using their harbour at Cherbourg?]

Turning to the England-India route, Sq. Ldr. Guest asked what was the difficulty about the Persian section. He said that there might be some diplomatic reason, but he had an idea it was parsimony, and if we had been ready to pay for our way-leave, or air-leave, we should have got it. We

THE TENTH BIRTHDAY OF THE ROYAL AIR FORCE.

he Royal Air Force came into being officially on April 1, 1918. On April 4, 1928, that is to say next week, the sual weekly issue of "The Aeroplane," very much enlarged, will be in effect a special Tenth Birthday Issue in onour of the Royal Air Force.

Without in any way attempting to give a history of the War in the Air, special articles in that issue will eal with the state of affairs which led to the creation of the R.A.F., and there will be a general review of the istory of the R.A.F. during the ten years after its creation in which it was done to death in its infancy, at one ear of age, and resurrected.

As there will be a particularly large demand for that issue readers of this notice are advised to order their pies within the next few days from their newsagents, or direct from "The Aeroplane," 175, Piccadilly. The rice will be, as usual, sixpence.

should not be denied permission to cross any other country for lack of reasonable expenditure.

In conclusion, he mentioned the national need for a permament, assured and prosperous aircraft industry, and suggested that a really bold expenditure and an elaborate Imperial civil air-route development would give it to us. [Surely Sq. Ldr. Guest does not seriously imagine that Imperial air routes, run with the care and efficiency of Imperial Airways, would provide the same amount of work for an aircraft industry that is provided by care-free and light-hearted flying officers who write off war machines by the dozen per annum in pursuit of their lawful occasions. One of the worst troubles of Imperial Airways is that they fly and maintain their machines so well that the machines have to be scrapped as obsolete while they are still fit for another ten years' flying.]

Mr. F. H. Rose (Aberdeen, Labour) delivered another of his Neonic attacks on airships. Apart from attacking airships, he suggested that a good number of the Cardington experts were only charlatans. [One likes Mr. Rose. He generally talks about four pages of Hansard, and what he says is only worth about four lines in THE AEROPLANE.]

Col. H. C. Woodcock (Liverpool, Everton District, Unionist), congratulated Sir Samuel Hoare on the wonderful progress of the R.A.F. and the efficiency to which he had brought it. But, he said, everything was not right with the R.A.F. He thought that the Air Minister was badly served on the financial side.

He said that we could not blame the officer commanding any unit for getting every allowance the Regulations permitted. The keener the officer the keener he was to get everything for his own men to make them more efficient. But a spirit of extravagance pervaded the whole Air Force.

The Air Force always found out anything that was to its advantage in the way of extra pay and allowances. It put in claims for hard-lying money, for example. Permanent officials at the Air Ministry should see that all expensive and luxurious ideas were cut down. [One recommends Col. Woodcock to go and spend the night in officers' quarters in almost any existing Air Station, and he will soon find who is doing the hard lying. Most of them are about as comfortable as the average police cell.]

He said that Civil Aviation could not be substituted for Military Aviation. One must be complementary to the other. He suggested that Civil pilots should have set training with the Air Force so that they would be in a position similar to that of the R.N.R. [He, like other critics, evidently does not know that all Imperial Airways pilots must be members of the R.A.F. Reserve.]

As to the Flying Clubs, he said that limiting our Clubs to £2,000 a year was economy wrongly applied, for in the Light Aeroplane Clubs the Minister was getting a splendid lot of men for the Air Force. [One doubts it. One would very much like to know how many of the men, women and children who have qualified as pilots at the various clubs would be of the slightest use in time of war. The women, of course, could not be used. Some of the men are too old, and probably a number of the others would not pass the doctor. Paying club subsidies for people who are useless strikes one as reckless expenditure, unless one faces the facts and admits that the subsidy is really paid to advertise aviation, to make the country airminded, and to make easier the extraction of money for future Air Estimates.]

Thereafter, Col. Woodcock suggested that the Air Ministry ought to support these Clubs by letting the Air Force give them assistance and displays and instruction. [Here one cordially agrees. If the Air Force gave a first-class display at the aerodrome of each Club about twice a year, and if some of the organising staff of the R.A.F. Display had a hand in running the shows, the Clubs would draw more gate money out of the local people than any of them are ever likely to draw in Air Ministry subsidies, and so the subsidies could be abolished. The displays would cost the Air Force nothing, because the flying would be all in the day's work. And the displays would be an excellent local advertisement for recruiting.]

On the subject of the Cadet College at Cranwell, Col. Woodcock protested against the expenditure of £260,000 and said that even that would probably grow to £500,000 before the Air Ministry had done with it, and that thus the cost of the Cadets would be excessive. [One would inform Col. Woodcock that the Royal Military College at Sandhurst cost over £260,000 in 1812, when money could buy a good deal more than it can to-day, and that very considerable additions have been made to the buildings since that date.]

He also complained that the cost of the College and the expenditure on it gave the Cadets a totally wrong idea of the standard of living, owing to the extravagance in which they were being brought up. [Will somebody in authority at Cranwell please ask Col. Woodcock to spend a day there with the Cadets and see whether they rejoice in riot living?]

Rear-Admiral Murray F. Sueter (Hertford, Conservati said that the critics of the airships ought to remember disasters which happened in the early days of submarin He reminded the House that German airships patrolled North Sea during the War and justified their cost as sc and as locators of our minefields and quoted Admiral Be as saying that one Zeppelin could do as much as five or cruisers. He said that the people at Cardington were skil aeronautical engineers who worked very hard and were charlatans.

Referring to the use of goldbeater's skin for the gas-b of airships, he said that during the War we produced material satisfactorily in this country. [Those for the R. at Howden have been procured in Germany to save ti but there is no reason why we should not produce them this country, or even have the material made in any Brit Dominion where cattle are slaughtered in quantities.]

Referring to Atlantic flights, he suggested that the Sec tary of State should consult the Aero Club and see wheth we could not get greater control over these people w want to fly the Atlantic. People ought not to be allowed do so unless their machines were properly equipped. [Why bring the Aero Club into it? (b) What *is* a prope equipped machine? (c) Why interfere at all?]

Capt. A. S. Cunningham-Reid, late R.F.C. and R.A (Warrington, Unionist), said that the best way of meeti hostile aeroplanes was with other aeroplanes, and that aeroplane was not useful only for offensive purposes. wanted to know what was the use of spending £98,000,0 the Army and Navy this year and only increasing the Force by four squadrons. He advocated a Navy just enough to protect our trade routes and an Army just enough for certain garrison work abroad and for the la defence of the coasts of Britain, with an Air Force wh would be the largest and most efficient in the World. [Qu sound sentiments.]

Mr. John Beckett (Gateshead, Labour) said that there w no logical or sensible line between having no Air Force all and having an Air Force which could easily vanquish a possible opponents in the rest of the World. He regarded warfare on civilians as barbarous. He suggested that keepi order in countries other than their own was no business ours and he said :—

> It is no uncommon thing for us to hear that some tribe in a off part of the earth has refused to pay taxes due to the great Brit Empire. Instead of sending a punative expedition of horse, foot guns to teach this tribe to obey and to pay our taxes, we now s bombing aeroplanes, and after the people have left their hom we bomb their town and bring them round to what is called sw reasonableness.

[The spelling of "punative" is Hansard's. Presumal it indicates a punitive expedition against native tribes.]

He argued that bombing was worse than the old custo of sending an expedition of horse, foot and guns. [He e dently does not realise that the more deadly the weapon t lower is the rate of casualties, and that aeroplane bombing cheaper in life to both sides of the argument.]

Finally he said :

> The Government go on making all these preparations for war, we shall find if they get into war that they will be just as ludic and helpless as those who struggled during the last War to s humanity.

[Which is quite true. When we do get into the next w we shall certainly find that all our beautiful weapons are u less and will have to be replaced by still newer types.]

Mr. George Pilcher (Penryn, Falmouth Division, Co servative) said that prophecy without a sense of reality u mately did the cause of early development more harm th good. He questioned whether the amenities of air transp had reached anything like the proportions which wou justify optimism about a seven-day journey to Delhi. questioned the conditions inside narrow cabins where th was no opportunities of sleeping. [When we have nig flying lines, sleeping berths will be easily arranged.]

He argued against the line to India as a commercial p position, because it served about the poorest part of t habitable globe. [Nobody proposes to carry Indian cool on the air line. There are plenty of rich people in t country to support it, and plenty of big business to se mails by it.]

He referred the Secretary of State to a speech "by h own air officer in India, the officer in charge of Civil Av tion" [presumably Colonel Shelmerdine], as saying th there was no perceptible sign of the development of air sense in the great mass of the Indian population; the was no desire to interest themselves in or embark on th particular form of communication. [That does not matt so long as the air line is used for commercial propositions accelerate and increase business.]

He also referred to the difficulty of flying in monso

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The Napier aero engine was fitted to the Supermarine-Napier seaplane which won the Schneider trophy for Great Britain in 1927— Speed 281·6 m.p.h.

The Napier aero engine was fitted to the Fairey-Napier aircraft which on two occasions have flown from Cairo to Cape Town and back— 100,000 engine miles

The Napier aero engine was fitted to the Dornier flying boat which flew from Spain to Buenos Aires— 12,518 engine miles

The Napier aero engine is installed in the four Supermarine-Napier flying boats which are now flying to Australia. They reached Singapore on 28 Feb.— 85,000 engine miles

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weather during three or four months of the year. [Well, anyhow, there are eight or nine other months in the year. In the worse monsoon weather air mails can get as far as Karachi regularly, and with the help of proper weather warnings it is possible to get through or round monsoon storms.]

Lieut.-Col. J. T. C. Moore-Brabazon (Chatham, Conservative) said that he enjoyed the pillow-fight between the airship enthusiasts. He opposed the idea of absurd rules to stop people from ocean flying. It was rather like stopping Drake from going round the world until the seas had been charted.

Discussing the Reserve Squadrons, he said the North London Squadron had no Mess, and practically no accommodation, and was equipped with a most unsuitable machine, known during the War as "The Charging Rhinoceros." It was wrong to put old and rather dangerous machines in the hands of more or less amateurs.

As to Pacifist speeches, all expenditure on aircraft was not for military purposes. You might as well say that in teaching a boy to sail a dinghy you were asking him to be a pirate. He had always said that the divergence between the civil machine and the military machine was becoming greater and greater every year.

Mr. W. T. Kelly (Rochdale, Labour) wanted to know why we were spending so much on Singapore and Malta [Perhaps he would like it spent in the Isle of Man] and made other noises like a Pacifist.

Major C. W. M. Price (Pembrokeshire, Conservative) raised the question of the insurance of aviators. He said that the premium was so high that insurance was impossible. He felt that if pilots wished to insure they should be allowed to do so at the rate of an ordinary healthy life, and that during their flying time the Government should find the difference between the premiums. By the time a man's flying life was over, at 38 or 40, insurance was practically impossible for him. All parties in the House were anxious to encourage thrift and insurance.

[This was really about the most sensible thing said during the whole debate on either side. Young officers in the Air Force should certainly be encouraged to insure themselves as ordinary lives. And the Government should certainly pay the difference between ordinary insurance rates and flying rates. Possibly some arrangement could be made by which the Government could pay the insurance on each man's flying hours as disclosed by his log-book after he had done his flying. Since the War enough figures have accumulated to allow the calculation of deaths against flying hours on a proper actuarial basis.]

Sir Samuel Hoare, replying on the Debate, said that this had been a very valuable discussion and that he would give careful consideration to the suggestions made. Two subjects which had seemed specially prominent were Civil Aviation and Airships. The trouble with Civil Aviation was money. He wished he had more of it for the purpose. Compared with foreign countries our routes might be shorter, but they were more reliable and more economic. In this we were ahead of the rest of the World, and we were making better progress than other foreign countries towards making Civil Aviation self-supporting and independent of Government subsidies.

British services now ran with 96% efficiency compared with 75% four years ago. The Cairo—Basrah route had completed its first year with 100% efficiency. In spite of foreign subsidies we were still carrying three-quarters of the passengers between London and Paris, and year by year the freight, mails and passengers were steadily increasing. On an economic basis foreign countries were little mo advanced than they were three, four or five years ago.

He hoped to lay on the table a white paper dealing wi the London—Karachi service. He thought that the ro to India would begin with a mail service and that wh that had been proved punctual a demand for a passeng service would grow. He assured the House that t Persian hindrance was not a question of money and th at the moment discussions were going on with the Persi Government.

As to pilots, he said that the Air Force needed a thous Short Service officers. At present Imperial Airways e ployed between 20 and 30 pilots, so he did not see h Civil Aviation could make up the numbers.

He suggested that it might be wise to let Civil Aviati develop on its own lines, not too closely tied up with milit conditions and considerations. He believed that the ci machine and the military machine would differ as much the Atlantic liner and the battleship. It would be a retrogra movement to tie up Civil flying with the Air Force.

Replying to Miss Wilkinson, he said that the Air For did what it could to find jobs for time-expired Short Serv officers and that the Estimates made provision for a spec employment organisation.

Referring to airships, Sir Samuel said that Mr. Rose alw spoke with conviction and that consequently everyone listen to him with unusual interest and attention. [Which says great deal for the forbearance and courtesy of the Hou Fancy having to listen to columns of Neon.]

In defence of the airship programme, he said that it w all an experiment and that it had the best possible adv and the best possible material. Whether the experimen were justified would be shown in the next two years.

On the subject of the defence of merchant shipping S Samuel Hoare told Lt.-Cdr. Kenworthy that on the hi seas it would be a Naval operation, that in the narrow se within reach of land the control would be in the hands of t Air Force. [That will be comforting news for mercha sailors who suffered at the hands of the Navy during the W 1914-18, and were left defenceless against submari attack when anything like an understanding by the Admiral of the use of aircraft would have saved them.]

Replying to Col. Woodcock Sir Samuel denied extrav gance, so Lt.-Cdr. Kenworthy made the suggestion th as we were only spending £10,000 this year on Cranwell Labour Government would have to finish the job. In answ Sir Samuel suggested that he was too sanguine. He add that considering the training, Cranwell was cheaper th Woolwich or Sandhurst.

Replying to Admiral Sueter, Sir Samuel asked him to to Farnborough and convince himself that the work there w worth the money.

As to trans-Atlantic flights, Sir Samuel said that it wou be unwise for a Government to interfere, though personal he would rather not see these flights attempted until we h machines better qualified to make them.

On the subject of insurance, Sir Samuel said he had tak what action he could with the insurance companies and th they had made substantial reductions in the premiums charg to flying officers. He added that he would take into accou the suggestion as to the State paying for the excess premiu on flying risks.

Motion made and question put, "That this House do agree with the Committee in the said Resolution." T House divided: Ayes 210; Noes, 88.

THE SUDAN EMBARGO.

Paragraphs have appeared recently in the papers stating that the Government of the Sudan has forbidden Lady Bailey (Moth-Cirrus) to fly across the Southern Sudan on her way to the Cape, and has likewise forbidden Lady Heath (Avian-Cirrus) to fly over the same country on her way to Cairo. The order seems fully justified. The country is almost entirely savage, part of it is still disturbed after the Nuer trouble, and there are large tracts where a machine might descend and never be traced. So evidently it is no sort of journey for a woman alone.

Statements have also appeared that Mr. R. R. Bentley, with his lately-wed wife, in the Moth which he flew to South Africa last year (for which flight he has just been awarded the Britannia Trophy), is to act as escort to these adventurous aviatrices, escorting the one North, and the other South on his return. This seems an absurd arrangement.

If his convoy made a forced landing he and his wife would have to land beside her, in which case he would have two women to defend, and would probably have two crashed aeroplanes to deal with, very likely on ground from which neither could ascend. The only other alternative (and a more sensible one) would be to fly on, or back, for help—which would probably arrive too late in any case.

The position reminds one of Mr. Neville Stack's rema about his flight from Malta to Khoms with Mr. Leete, wh he said that if either had come down in the sea the oth could have done nothing except fly to Khoms and rep where he "last saw him bobbing."

A more sensible, if more expensive, method of doing t journey would be to fit the machines with floats for t journey from Khartum to the Great Lakes, or *vice-ver* so that a forced descent would at any rate bring t machine down in the track of the regular steamer service

C. G. G

THE AIR MINISTRY DURATION TEST

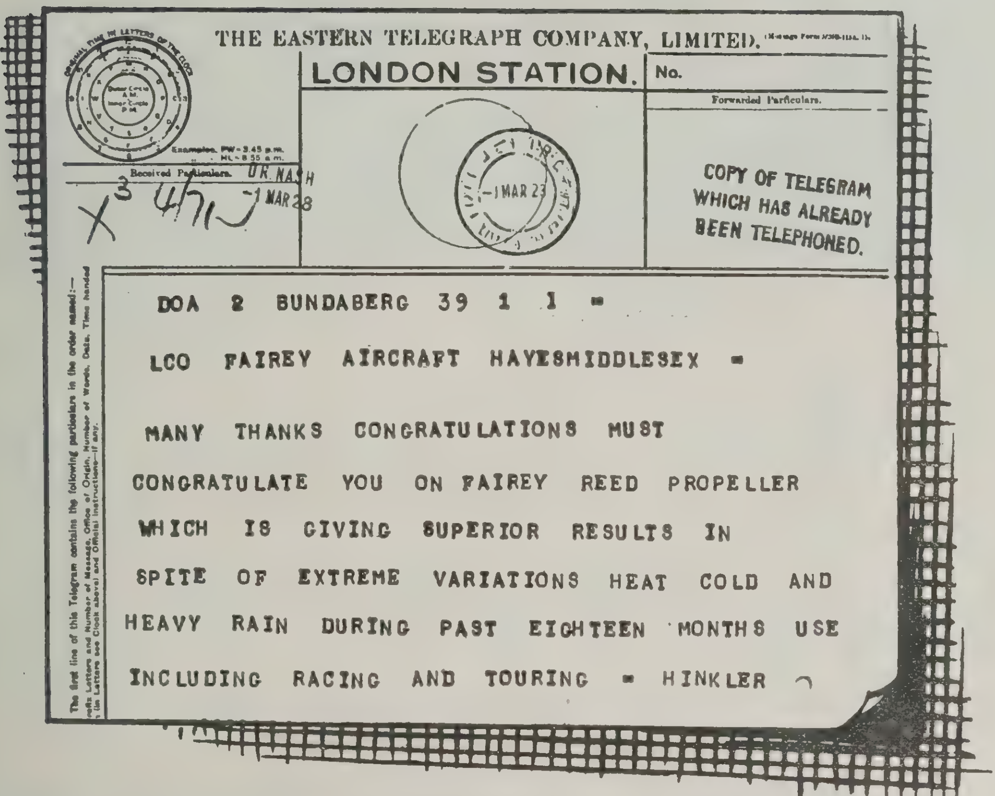
On March 26 the following official statement was issu by the Air Ministry:—

"The reports that the Air Ministry has decided to ma an attempt this year to break the world's long-distance n stop flight record are premature.

"The position is that an aeroplane is being built with t purpose of making exhaustive tests at home to determi how long an engine will actually run in air under norm flying conditions.

"This aeroplane will naturally be a machine which mi well beat the present (time) duration record. The questi of a long-distance flight will only be considered after su tests have been carried out satisfactorily."

HINKLER'S GREAT FLIGHT



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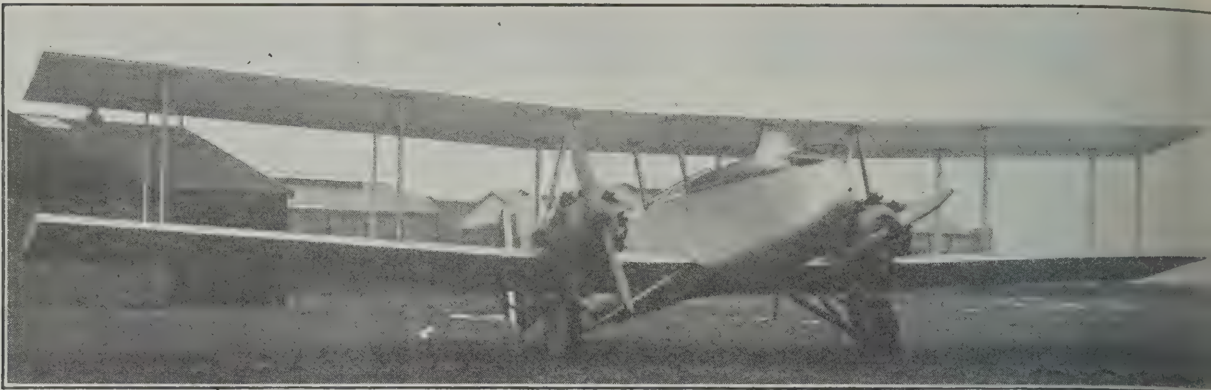


THE BOULTON AND PAUL SIDESTRAND.—A three-seat medium-range day-bomber fitted with two 450 h.p. Bristol Jupiter engines.—(*"Aeroplane" photograph.*)

The Sidestrand is a three-seater, medium-range, twin-engined bomber of all-metal construction, designed and built for the R.A.F. by Boulton and Paul Ltd., of Norwich.

This machine is doubly interesting, firstly on account of its excellent all-round performance, and secondly because of the remarkable developments in metal construction embodied in it.

Wings.

The Sidestrand is a biplane with a central fuselage, fitted with two Jupiter VI engines mounted on nacelles carried on the lower wings and driving tractor airscrews.

Both top and bottom wings are in three sections—a centre section extending to the engine mounts and a pair of extensions. The wings have appreciable stagger, and a noticeable sweepback. They have two rows of interplane struts on each side beyond the engine mountings, and are braced in the usual way with streamline wires.

Ailerons, which are balanced by shielded horns, are fitted to both wings.

Fuselage.

The fuselage—which is very deep and relatively narrow—despite its size is of remarkably low resistance, and in addition gives all the occupants an excellent view for their particular purposes. This fuselage has flat sides, domed top and bottom surfaces, and a very fine entry.

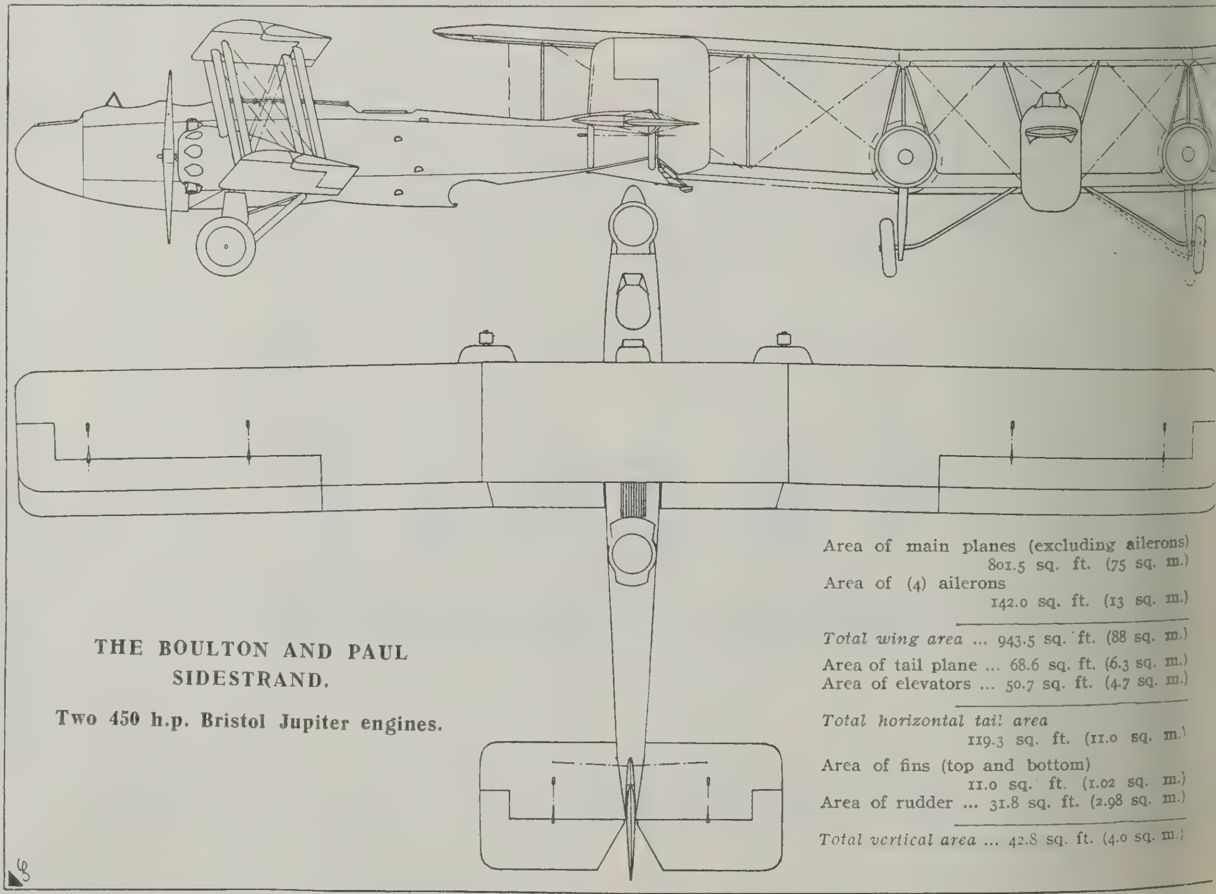
In the nose of the body is a cockpit for the front gu and bomber. The front gun is carried on a Scarff ring, owing to the narrowness of the body here this gun ca used on targets nearly vertically below.

For bombing, the occupant of this cockpit may lie d and he has then a view from nearly dead ahead to well vertically downwards through a window provided for purpose. In this position the bomber has ample room the comfortable use of his bomb-sights. He is prov with an ingenious hand-operated fine adjustment on rudder control whereby he can himself correct the co steered by the pilot without in any way interfering with pilot's freedom of control.

A little behind the front cockpit and well above it is pilot's cockpit. Owing to the drop in the fuselage top ward the pilot can see ahead at an angle well below horizontal—a point of great importance for the steerin the accurate course necessary in bombing operati Further, because the fuselage is narrow, he is able to down at a very steep angle on either side of cockpit.

The pilot's seat is well ahead of the wings and of the screws, and the view all round is as nearly the ideal pi view as has yet been achieved in a machine of this size.

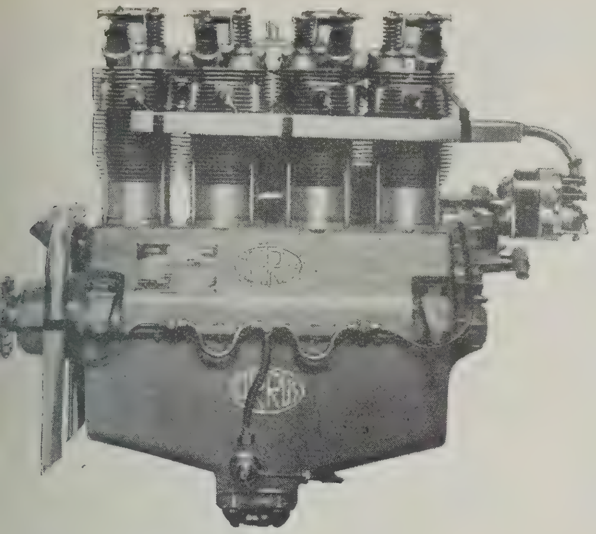
Well behind the wings is a third cockpit with a Sc



THE BOULTON AND PAUL SIDESTRAND.

Two 450 h.p. Bristol Jupiter engines.

Area of main planes (excluding ailerons)	801.5 sq. ft.	(75 sq. m.)
Area of (4) ailerons	142.0 sq. ft.	(13 sq. m.)
Total wing area ...	943.5 sq. ft.	(88 sq. m.)
Area of tail plane ...	68.6 sq. ft.	(6.3 sq. m.)
Area of elevators ...	50.7 sq. ft.	(4.7 sq. m.)
Total horizontal tail area	119.3 sq. ft.	(11.0 sq. m.)
Area of fins (top and bottom)	11.0 sq. ft.	(1.02 sq. m.)
Area of rudder ...	31.8 sq. ft.	(2.98 sq. m.)
Total vertical area ...	42.8 sq. ft.	(4.0 sq. m.)



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Lieut. H. H. Bentley, A.F.C., S.A.A.F.

BRITANNIA TROPHY, 1927. Awarded to
Lieut. H. H. Bentley, A.F.C., S.A.A.F.

1st KING'S CUP AIR RACE, 1926.
Capt. H. S. Broad, A.F.C.

1st KING'S CUP AIR RACE, 1927.
Capt. L. W. Hope.

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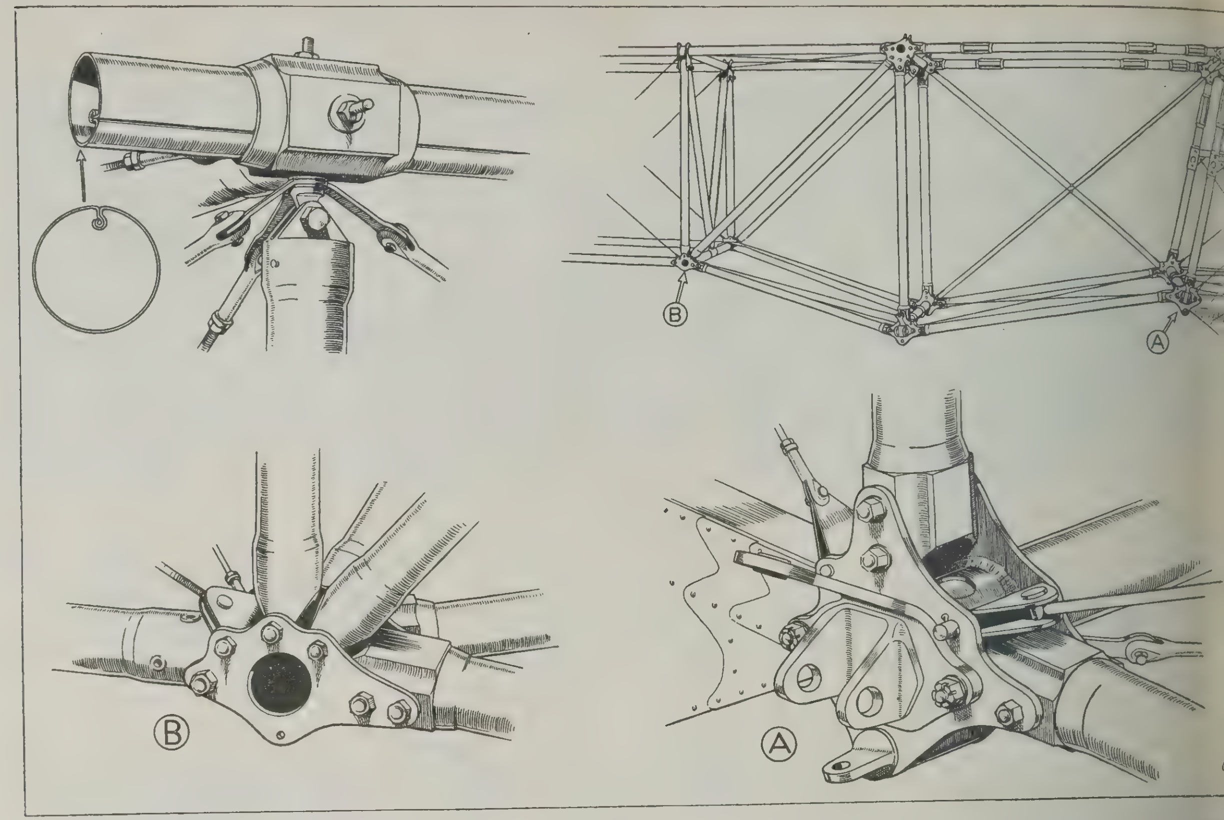
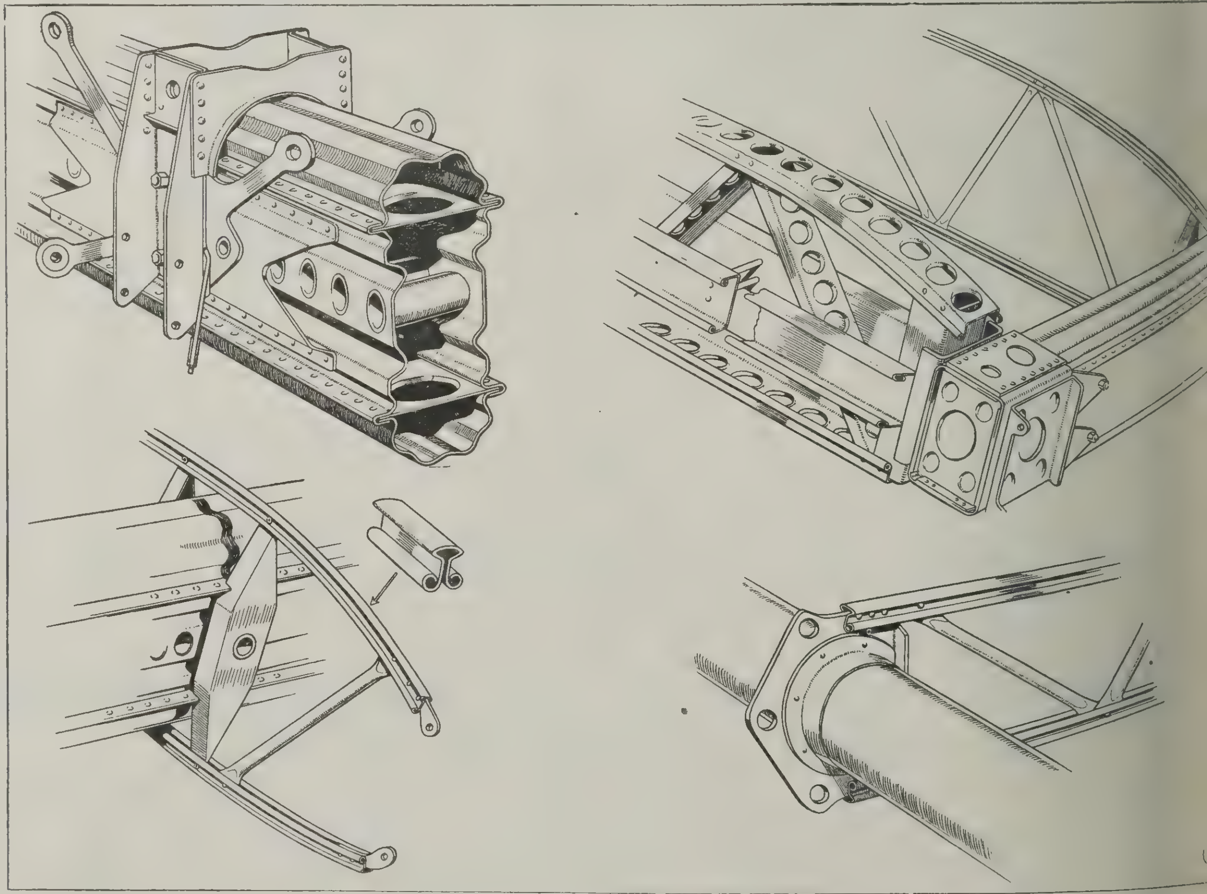


SIDESTRAND FUSELAGE DETAILS.—Top left, normal fuselage joint, showing one of the magnesium-alloy sleeves on the locked-joint tube. Top right, part of the forward fuselage framing. A is the front spar attachment and B is the joint between the central and the tail section of the fuselage.

ring mounting. This cockpit is fitted with a folding seat for its occupant, and has below it a second prone position from which the aft-gunner can use a machine-gun out through a port in the under-side of the body.



SIDESTRAND WING CONSTRUCTION.—Top left, spar with interplane strut and wire fittings. Top right spar-end and end box-rib. Bottom left, rib attachment to spar and rib-boom section. Bottom right, attachmen of control-surface rib to torque-tube.

TAIL UNIT.

ail unit is of the monoplane type with a single rudder and fin. The tail-plane is adjustable for m the pilot's seat. To take care of rudder loads ing on one engine only the pilot has a pair of pull- s, which when operated apply a pull on the rudder- ugh a spring. These may also be used by pulling levers together to hold the rudder in position for a straight course, and thus relieve the pilot of rudder on long flights.

levators and the rudder are balanced by shielded

UNDERCARRIAGE.

ndercarriage consists of one axle on each side, o the bottom edge of the fuselage, supported by a ertical telescopic leg running down from the front r below the engine of the axle. Attached to the rigid of the telescopic leg are two thrust tubes which aft to a fitting on the rear spar in a line with the dercarriage fitting.

lescopic leg is of the oleo-pneumatic type, and is ntirely by compressed air. The tail skid is sprung ilar, though smaller, oleo-pneumatic member. The ed air cylinders in these units may readily be to the required pressure through an easily acces- ve,either from an air compressor or from bottles. In is found that reinflation, or rather, bringing up to al pressure, is required only at intervals of several

POWER PLANT.

o Jupiter VI engines are carried on hinged mount- n tubular frameworks built on to the lower wing ections. Thus the whole engine with its cowling swung out of place after removing two tapered olts, and the whole of the auxiliaries at the back of ne become accessible. The engines are cowled to nly the cylinder-heads to the air and to allow the o the cowling of sufficient air to cool the crankcase. of the engine cowling is continued back and swept the surface of the wing itself by cowling which the engine support framing and the oil tanks.

carried in two main tanks, one service tank and a reserve tank, inside the fuselage between the pilot's and rear gunner's cockpit.

Constructional Details.

The Sidestrand, apart from covering—which is of fabric—and some minor details, is entirely constructed of steel and light alloy. High tensile steel giving a proof stress of approximately 60 tons per sq. in. is used for the more highly stressed members, and duralumin for many of the secondary members.

WING SPARS.

The wings have steel spars built up from strips of H.T. steel rolled to section, and hardened and tempered after rolling Sketches reproduced show the type of spar used on the Sidestrand. From these it will be seen that the spar is of a type of box section, consisting of two corrugated flange members, two corrugated web members, and a pair of uncorrugated strips which tie the joints between webs and flanges together on each side.

In addition the web members are tied together by a series of tubular pieces, which are doubly flanged on to the web.

At first sight such a spar may seem a complicated and expensive one to produce but in practice, manufacture and assembly is rapid and economical. Boulton and Paul Ltd. have found it possible to standardise a very small number of flange and web sections, and by varying combinations of these to produce a range of spars suitable for practically any wing structures that could be required.

These standard sections can be rolled with extreme accuracy in lengths of up to 75 ft. each at a surprisingly high speed and at very little cost in labour.

To assemble any given spar, the required components are drawn from stores, and are slid into position, flanges into the fold in the edge of the webs, by unskilled labour. Rivetting is done in a semi-automatic machine which spaces and drills two holes—one in each side of the spar—and closes up the rivets in another pair of holes at the same time and completes the spar assembly at a surprising rate. Certainly so far as labour goes these spars are more economical than are wooden ones.

SPAR FITTINGS.

Fittings for the attachment of struts, etc., to these spars

BOULTON AND PAUL SIDESTRAND.—Two further views of the Sidestrand (two Bristol Jupiter engines) piloted by Sq. Ldr. Rea, the firm's test pilot.—*("Aeroplane" photographs.)*

are attached to flange plates of H.T. steel which fit between the ledges formed by the joints of spar web and flange members, and are secured by the same rivets as hold the spar components together.

The details of such fittings necessarily vary for each particular case, but the design and manufacture of these items has been greatly simplified by the standardisation of lug sizes and the like. Specimens of typical fittings are shown in sketches.

RIBS.

Ribs are Warren girders of duralumin. Fore and aft members of these ribs are made from a standard rolled section, which provides a flat face with rounded corners in contact with the fabric, and allows for very simple fixing of the bracing members. These are made of duralumin tube, flattened at the ends, inserted between the two sides of the rib boom section, and rivetted in place. The ribs are secured to the spar by flanged duralumin plates rivetted into the booms, and held to the spar by hollow rivets passing through the tubular spacing members.

These ribs are exceedingly light and strong, and are simple to make.

In the Sidestrand the ribs are spaced very widely, and to prevent excessive sag of the fabric between ribs, stiffeners—which are lengths of plain round duralumin tube bent to the curvature of the upper wing surface—are slipped into pockets sown on the inside of the fabric covering.

FUSELAGE.

The fuselage of the Sidestrand consists of three sections. From the nose to the front spar of the lower wing the whole structure is of duralumin. There are four main longitudinals and half a dozen or so frames of channel section. The domed top above, and the bottom below the four longitudinals, are covered in sheet duralumin. This constitutes a semi-monocoque type of structure which is very light, and gives a maximum of space inside the covering for the stowage of equipment.

Behind this duralumin section is a central section to which the wing centre-sections are attached. This is built up of solid-drawn steel tubes with machined steel fittings wire braced.

Behind this again is the tail section. This again is all of steel, but it is made from tubes drawn from H.T. steel strip with an internal locked-joint. The lower rails of this tail section are at a considerably higher level than the bottom rails of the central section, which make it possible to place the rear gunner in his prone position entirely below the fuselage framing proper in a special sub-framing which forms the bottom fairing of the body.

For the attachment of strut and other fittings to the steel tube longerons, magnesium alloy die-castings are slipped over the tubes. These castings provide four flat faces and flat plate fittings of H.T. steel are bolted to these faces by bolts through the castings and longerons.

These magnesium alloy sleeves are very light, and quite cheap. They are given a chemical treatment which is a trade secret as a protection against corrosion and are afterwards cellulose-lacquered. Samples so treated have been exposed for long periods to salt-sprays without signs of corrosion, so that there is little likelihood of trouble in ordinary service for years.

Strut-ends are of the ordinary machined socket type, fitting outside the struts and pinned in place.

SPECIFICATION.

DIMENSIONS.—Span 72 ft. 0 in. (21.95 m.), Length 40 ft. 6 (12.32 m.), Height 14 ft. 10 in. (4.51 m.), Wing area 9 sq. ft. (88 sq. m.).

WEIGHTS AND LOADINGS.—Weight empty (without mili equipment) 5,274 lbs. (2,395 kg.), Fuel 260 galls. (1 litre) = 1,980 lbs. (900 kg.), Oil 30 galls. = 300 lbs. kg.), Crew (3) 540 lbs. (245 kg.), Load and equip 7.58 lbs. (345 kg.), Total weight loaded 8,852 lbs. kg.), Wing loading 9.37 lbs./sq. ft. (45.7 kg./sq. Power loading 9.84 lbs./h.p. (4.47 kg./h.p.).

PERFORMANCE.—Max. speed at 5,000 ft. (1,575 m.) 130 m (209 km.h.), at 10,000 ft. (3,050 m.) 129 m.p.h. (208 km at 15,000 ft. (4,625 m.) 122 m.p.h. (197 km.h.), Clim 5,000 ft. (1,575 m.) 5.0 mins., to 10,000 ft. (3,050 m.) mins., to 15,000 ft. (4,625 m.) 19.0 mins., to 20,00 (6,100 m.) 35.5 mins., Service ceiling 21,500 ft. (635 Landing speed 51 m.p.h. (82 km.h.), Run to take-off yards (103 m.), Landing run 193 yards (187 m.).

A LIGHT SURVEY AEROPLANE.

The Avro Avian recently purchased by Mr. F. P. Rayn of the Air Survey Co. Ltd. has been completely equip for aerial survey work by fitting to it a Wilkinson E camera and the necessary equipment. A diagram whic reproduced shows how exceedingly neatly this camera been installed, but it does not give any idea of the prisingly roomy accommodation for the photographer w remains in the front cockpit with the camera in place.

Trial in the actual machine shows that the presenc the camera in no way interferes with the passenger's fort, and shows that it is possible with great ease to cha magazines and to operate the camera from this seat.

There is however no necessity for the presence photographer for any photographic flight on this mac so long as not more than 100 exposures (one magazine) to be made, as the pilot is provided with a remote con for the camera.

Only for work requiring more exposures and therefore changing of magazines in the air, is a second man ne sary. For such work three magazines may be carried.

The camera is carried on an adjustable mounting imm ately in front of the operator, who sits with his feet either side of the camera cone. The camera is so pl that it can be easily adjusted for angle, etc., and the m zine can be readily changed. Provision is made for ca ing two spare magazines in a cupboard let into the ins ment board in front of the operator.

The standard attachment brackets for accessories such motor, electrical control, and mechanical control, are mou in convenient positions in the aircraft and the whole stallation can be fitted and removed from the machin quite a short time.

The installation of the Eagle aerial camera does not i fere with the fitting of the standard dual control in machine, except that the front stick cannot be used w the machine is carrying the camera. When the camer removed the front control-stick can be slipped into place the machine used as a dual-control two-seater immedia

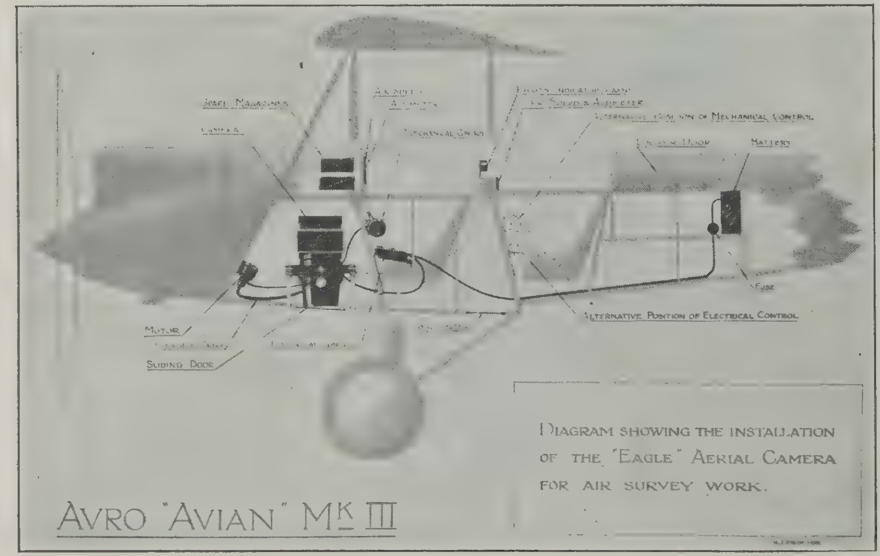
The installation of the Eagle Camera in the Avian o up a new field of usefulness for the light aëroplane, and cost of an aerial survey can be very materially reduce the use of the Avro Avian for this w This reduction in cost applies both t initial cost and the running charge

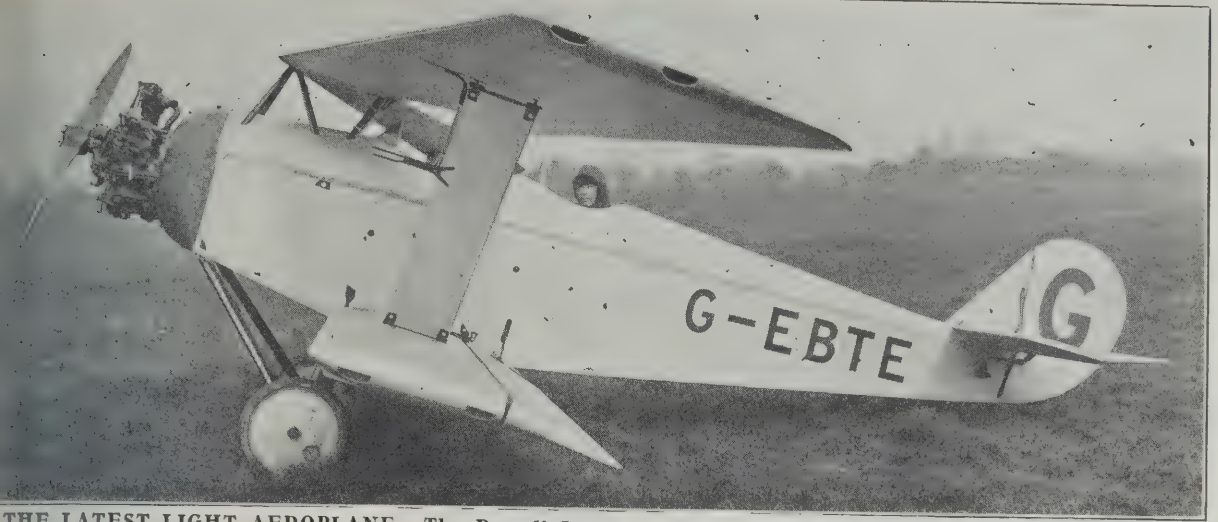
A feature which makes the Avian ticularly suited for the installation o aerial camera is the fact that the f lage of this machine is consider wider than that of the majority of aeroplanes, which gives more room greater comfort to the operator.

When the machine is flown as a si seater the front cockpit decking w is made to hinge up out of the wa order to provide easy access to the f cockpit, is removed and replaced special section of decking without a in it, thus making the machine in clean single-seater.

A feature of importance in a mac for aerial survey is that no part of undercarriage should interfere with camera field of view, and this featu provided by the split axle undercarr of the Avian, which leaves an enti unobstructed field of view.

The Avian can also be arranged seaplane for this work.


Spare Magazines
Camera
Alternative Position of Mechanical Control
Battery
Fuse
Alternative Position of Electrical Control
Motor
Sliding Door
Diagram showing the installation of the "Eagle" Aerial Camera for air survey work.
Avro "Avian" Mk III



THE LATEST LIGHT AEROPLANE.—The Parnall Imp, an all-wood cantilever biplane (65 h.p. Armstrong-Siddeley Genet engine) designed for the private owner.

THE PARNALL IMP.

e Parnall Imp, which made its first public appearance roydon on the occasion of the King of Afghanistan's last week, is in many ways the most interesting two- light aeroplane which has yet been produced in this ry.

is novel both in arrangement and in construction, and ovel features should make it very attractive to the te-owner.

e Imp is a cantilever biplane, built, except for a com- vely small number of metal fittings, entirely of wood. wings and fuselage are covered with spruce veneer, is the main stress-carrying member.

e top wing has a very acute sweep back. The lower has no sweep back.

a result the top centre-section is ahead of both the which are arranged in the usual tandem. The top e-section is edge-on to the occupant of both seats, and er has his upward view blanked off at all.

ward and downward the view is exceedingly good. the front seat the leading-edge of the lower wing is d the vertical. From the back seat a view ahead of wer wing at about 45° is given. The Imp has in fact earest approach to a perfect view from all seats that et been provided in a tractor biplane.

wing structure is very unusual. The upper wing is in two sections, pin-jointed to a central cabane above uselage. Flying and landing loads from the upper are transferred to the lower wing at a point about four ut on each side of the fuselage, by inclined struts.

lower wing is in one piece, and its framing passes across and below the fuselage structure. This lower carries its own loads and those transferred to it by ruts as a cantilever.

wings do not fold. To provide for stowage in a space, the upper wings are rapidly detachable from the , and after removing these, the lower wing comes from the fuselage. This arrangement is a little less convenient than the usual folding arrangement, but this minor inconvenience has to be set off against the solid and simple construction of the whole machine, and the total absence of rigging.

The Imp was completed only a few days before her arrival at Croydon, and complete figures for performance are not yet available. Preliminary trials have given very promising results, and a complete technical description of the machine will be given as soon as the necessary data are available.

THE U.S. NAVY AVIATION BUDGET.

The Supply Bill of the U.S. Navy Department reported to the House of Representatives on Mar. 21, provides for a total Naval Aviation Vote of $32,735,000 (£6,547,000) of which $16,500,000 (£3,300,000) is for new aeroplanes.

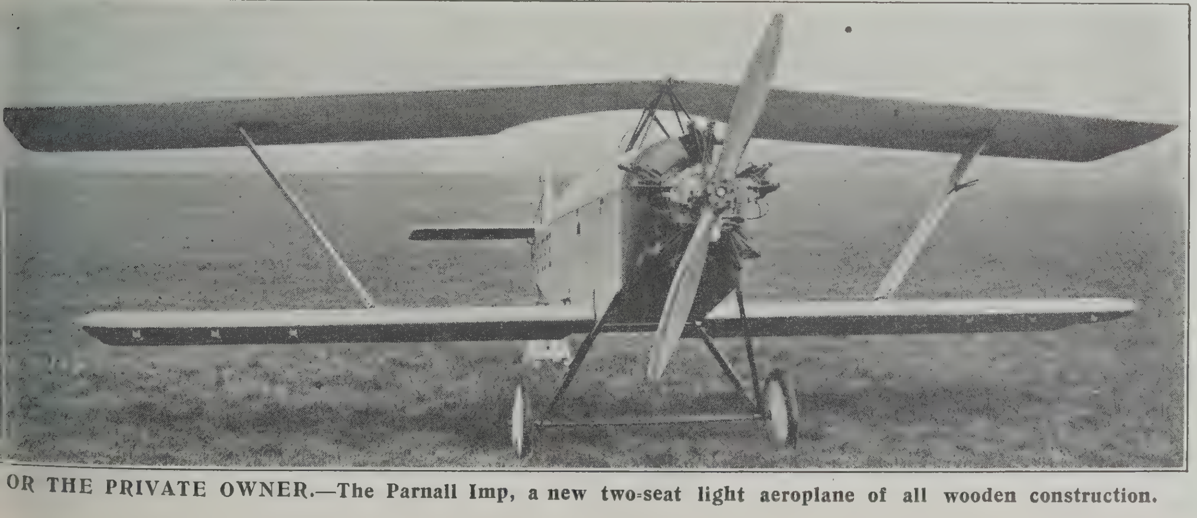
Included in the total figure is a vote for the cost of constructing two new rigid airships, each of over 5,000,000 cubic ft. capacity.

According to the evidence put before the House by Admiral Moffett, these ships are to be 782 ft. long and about 130 ft. diameter. Their maximum speed is to be 75 knots (86 m.p.h.) and their cruising range 11,200 nautical (12,900 statute) miles. The estimated total cost of the two ships is $8,000,000 (say £1,600,000) of which the House has voted $2,000,000 (£400,000) for work to be started during the coming year.

THE ROYAL AERONAUTICAL SOCIETY.

A paper by Dr. Hele-Shaw and Mr. T. E. Beacham on "The Variable Pitch Airscrew" will be given before the Royal Aeronautical Society on Thursday, April 12. The meeting will be held at the rooms of the Royal Society of Arts, John Street, Adelphi, at 6.30 p.m.

The Hele-Shaw Beacham variable-pitch airscrew, which has been developed by the authors in conjunction with the Gloster Aircraft Co. Ltd., has now been successfully tested in the air, and the lecture will describe this type of airscrew in detail.



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AERONAUTICAL ENGINEERING
SUPPLEMENT TO "THE AEROPLANE"

IE CONSTRUCTIONAL DESIGN OF METAL FLYING-BOAT HULLS

By F. LANGLEY, A.M.I.AE.E.

INTRODUCTION.

ie scope of this paper is strictly that indicated in the
. It approaches the subject rather from the point of
of the naval architect than from that of the aerodyna-
al expert. Nothing is said of the form, lines and sta-
y problems of hull design nor of the aerodynamics of
flying-boat as a whole.

any excellent papers on these branches of the subject
appeared during the last few years. It is hoped in a
article to deal with the actual workshop process of
ding a hull.

MATERIALS.

ppard in "Note on the Comparison of Metals as Aero-
e Structural Materials" (R. and M. 729) has compared
l and Duralumin on a basis of strength for weight.
s in "Notes on Magnesium and its Alloys" (R.Ae.S.
nal, December 1926) has extended his method to include
tron.

though Duralumin is at present the only material used
ull building, these papers are worth study, particularly
iew of the present research into the anti-corrosive pro-
on of magnesium alloys. If this research should meet
success one can foresee that Duralumin may have a
serious rival.

vo other future "probables" may be mentioned. The
of these is "Alclad," a product of the Aluminium Com-
of America, and an account of it appears in N.A.C.A.
nical Note No. 259 (August 1927). It consists of a sheet
uminium alloy of considerable strength, both sides of
h are metal-sprayed with pure aluminium. The mate-
is heat-treated, and diffusion of the alloy into the pure
l takes place, thus ensuring perfect cohesion.

e purpose of the aluminium coating is to protect the
from corrosion, and some remarkable results are
ied. It is said to be much superior in this respect to
inium alloy with the surface anodically treated.

figures are, however, given for its physical properties,
further particulars are awaited with interest.

e second but more distant "probable" is Beryllium
, some particulars of which were given in *The Scien-
American,* November 1927. Pure beryllium is one-third lighter than, four times as elastic as, aluminium, 25% more elastic than steel. It will scratch glass like hard steel. When alloyed with aluminium in the proportion of beryllium 70% and aluminium 30% the product is said to be one-fifth lighter than aluminium, to be far more resistant to corrosion, and to have a much greater tensile strength than duralumin. Its cost is at present prohibitive, but if and when that difficulty is overcome it may be an extremely useful metal.

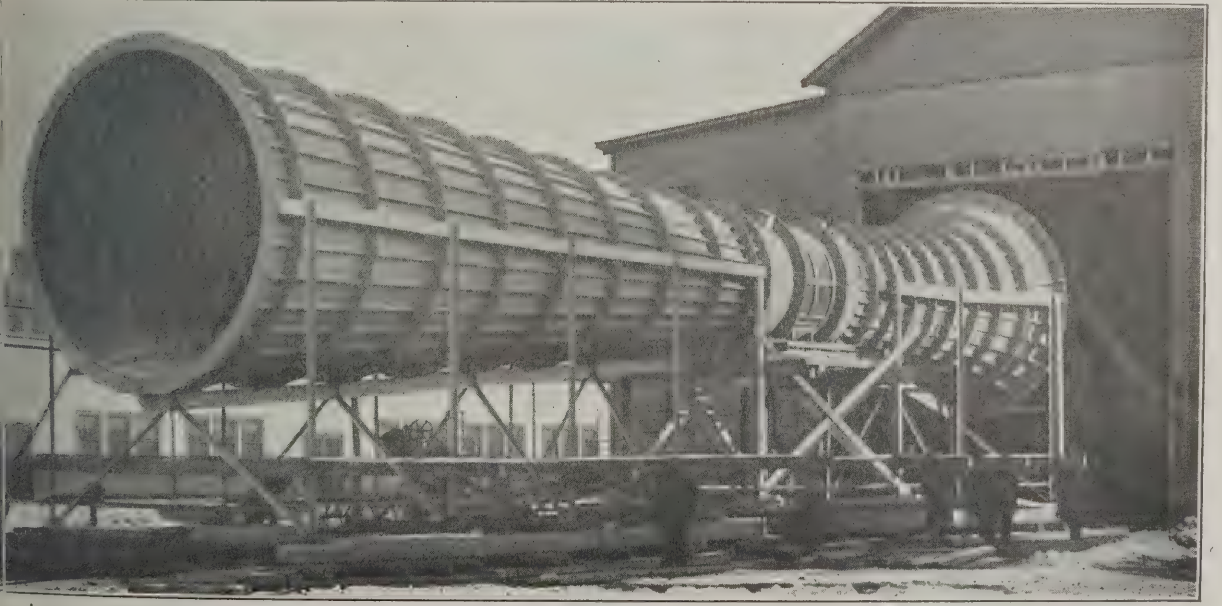
For the present, however, we have only duralumin to consider. No official standard figures for its strength, except the ultimate tensile, are available. The following figures are averages of those used for stressing by four different aircraft firms in this country:—Ultimate tensile, 23 tons sq. in.; maximum shear stress, $14\frac{1}{4}$ tons sq. in.; maximum bearing stress, 27 tons sq. in.; yield and compression, 16 tons sq. in. Young's Modulus is 4,700 tons sq. in., its specific gravity is 2.8 and its weight 175.3 lbs. per cubic foot, or 0.101 lbs. per cubic inch.

The principal casting alloy now used is "Alpax," whose composition is:—Manganese not more than .5%, iron not more than .75%, silicon not more than 10-14%, aluminium the rest. Its ultimate tensile strength is 12 tons per sq. in., elongation 7%, and specific gravity 2.68. It makes very satisfactory castings down to 0.10-inch thick and, unlike duralumin, it can be welded either to itself or to pure aluminium. It machines well, and on this account is frequently used instead of duralumin where a part is required to be welded to aluminium.

SCANTLINGS.

In the present stage of metal-hull design no tradition or general practice of scantlings has yet sprung up. There has been no co-ordination amongst the various designers engaged in this work except that due to the supervision of the Air Ministry. Nor has a reliable method of predicting the strength of a hull by mathematical methods been found.

I believe that the stress department of one flying-boat firm makes some attempt to calculate the strengths of the planing bottoms of hulls, taking as a basis the Aeronautical Research Committee's "R. and M. No. 683." This report gives the results of some experiments carried out on an old



A new seven-foot diameter wind tunnel going into place at the Massachusetts Institute of Technology.

F3 hull and an H16 hull to determine the maximum loading which may occur on the planing bottom. How far these results are applicable to modern designs, and of what value are stress calculations based on them, is problematical.

A later paper from the same source, R. and M. No. 926, gives the results of impact tests on a P5 flying boat hull. Since the worst case recorded on these tests shows a load of little over half those of F3 and H16 hulls the issue is only confused, and no safe conclusions for untested designs may be drawn. Those who are interested in this aspect of the problem should refer to papers by Professor Abel (Trans. I.N.A. 1923, Vol. LXV, p. 161), and Professor Inglis (Trans. I.N.A. 1925, Vol. LXVII, p. 145), in which are discussed the behaviour of stiffened thin plating under water pressure.

Under this heading I shall therefore only give some average figures for a typical 45 feet hull, to be built in duralumin, with longitudinal shell-plating, and framed rather on the principle of the Isherwood ships, i.e., with deep frames widely spaced and longitudinal stringers close together. Apart from the boats built by Short Bros. Ltd., under their own patents, most of the hulls built in this country have been based on this method.

Figs. I and II show scantling sections of such a hull.

The planing bottom in its most highly stressed part forward of the main step is plated with 14 s.w.g. sheet, the remainder being 16 s.w.g. except towards the stern where it is reduced to 18 s.w.g. The topside plating is 16 s.w.g. to 18 s.w.g. with 20 s.w.g. at the top and ends. A good "shift of butts" should be made in the shell, that is to say, butts in adjacent strakes should be separated by one or more frame spaces. Even butts in alternate strakes should not occur in the same frame space. A butt is always liable to be a point of weakness and so they should be well separated rather than concentrated in one zone.

The transverse frames have an average spacing of 24 in., being closer together at the forward end and doubled at the main plane spar positions. They are constructed as shown in Figs. III and IV and are 18 s.w.g. thick amidship and 20 s.w.g. at the ends.

Certain of the frames should be made without lightening holes in the floor portion, to act as bulkheads. The number which are treated like this is a matter of calculation, and should be so arranged that if a leak occurs in one compartment the boat would not settle or trim sufficiently to allow the water to flow over the top of the floor into the next compartment and so sink it immediately.

It is usual to cut notches in the frames to allow the stringers to pass through unbroken from stem to stem. In view of the success of the latest Isherwood developments and of the opinions expressed by Professor Abel (Trans. I.N.A. 1923, Vol. LXV, p. 161) this hardly seems necessary.

I would suggest that a continuous keel and dorsal together with a side keelson, and four intercostal girders on each side would be sufficient to help out the shell in carrying the main longitudinal stress.

The intermediate stringer angles whose function is to prevent local buckling of the shell need only run between frames and not even be attached thereto. The standing flanges of these stringer bars or channels should be snaped off at angle of 30° as shown in Fig. V.

The shell angles of the longitudinal girders should, ho ever, be continuous and be notched into the frame wel The intercostal plates mounted on them should be attach to the frame webs by short angles, say ⅝ in. × ⅝ in. × 16 s.w. and the whole connection finished off as shown in Fig. This applies equally to the side girders and to the si keelsons.

The centre keelson and dorsal are quite continuous b in plates and angles. These are the first members to erected, and the frames are made in halves, port and st board, to be attached on each side. (See Figs. VII a VIII.)

Where, owing to the limitations of plate sizes, it is nec sary to make a break in the keel and dorsal plates, t break should be made good by butt straps (see Fig. D Such breaks should, of course, occur between frames. Th will give an opportunity for reducing the centre keels from its midship thickness of 18 s.w.g. to 20 s.w.g. at t ends. It will hardly be necessary to make any special p vision for a break in the bottom angles of the keelson or t angles of the dorsal as the plating will transmit the lo past the point of break.

Cuts in the angles on the free open edges of the keel dorsal should be covered by a butt strap. Care should taken when designing to see that such cuts and breaks occ at as widely varying places as possible. It would be a gr point of weakness, for example, if a break in each of the fo angles and also of the plate of a girder were all allowed the same frame space.

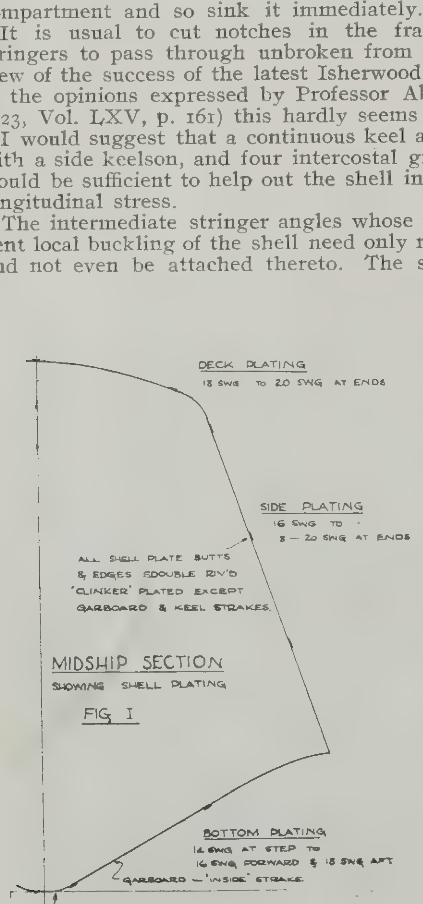
Similarly, it may not be found possible, to run an unbrok length of chine bar from stem to step, etc., although it better to do so. If a break should be necessary it ought to occur in the same frame space as a butt in the adjac shell plates.

The construction of the steps presents points of particu difficulty, since duralumin cannot be hammered or beat into the same awkward shapes which are possible in ste Nor has a satisfactory method yet been found of welding All the riveting must be perfectly accessible and there m be no corners where moisture can accumulate without tection.

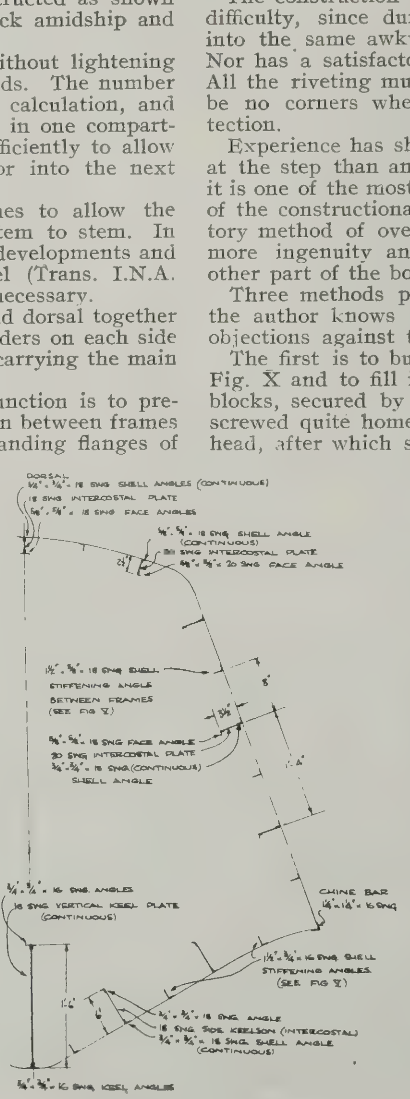
Experience has shown that leakage is more likely to occ at the step than anywhere else in the hull not only beca it is one of the most highly stressed parts but also on accou of the constructional difficulties. To devise a really satisf tory method of overcoming these troubles probably calls more ingenuity and real skill in detail design than a other part of the boat.

Three methods present themselves at once, two of wh the author knows have been used. All three have seri objections against them.

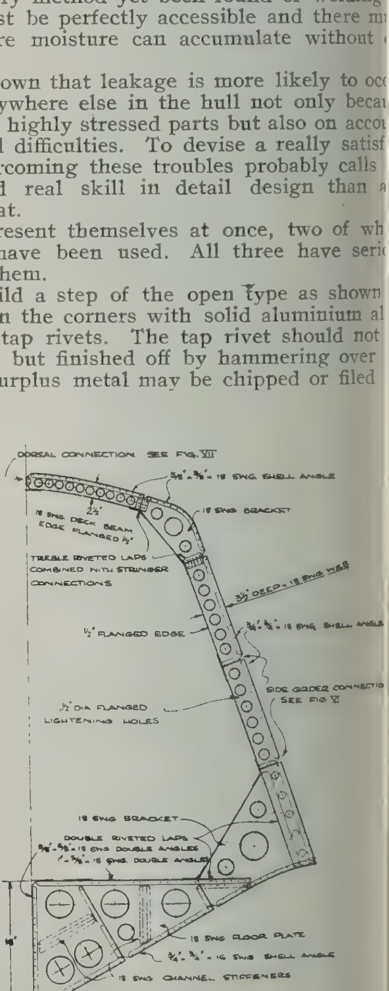
The first is to build a step of the open type as shown Fig. X and to fill in the corners with solid aluminium al blocks, secured by tap rivets. The tap rivet should not screwed quite home but finished off by hammering over head, after which surplus metal may be chipped or filed


DECK PLATING
18 SWG TO 20 SWG AT ENDS
SIDE PLATING
16 SWG TO
8 – 20 SWG AT ENDS
ALL SHELL PLATE BUTTS & EDGES SDOUBLE RIV'D 'CLINKER' PLATED EXCEPT GARBOARD & KEEL STRAKES.
BOTTOM PLATING
14 SWG AT STEP TO
16 SWG FORWARD & 18 SWG AFT
GARBOARD — 'INSIDE' STRAKE
KEEL — 'OUTSIDE' STRAKE

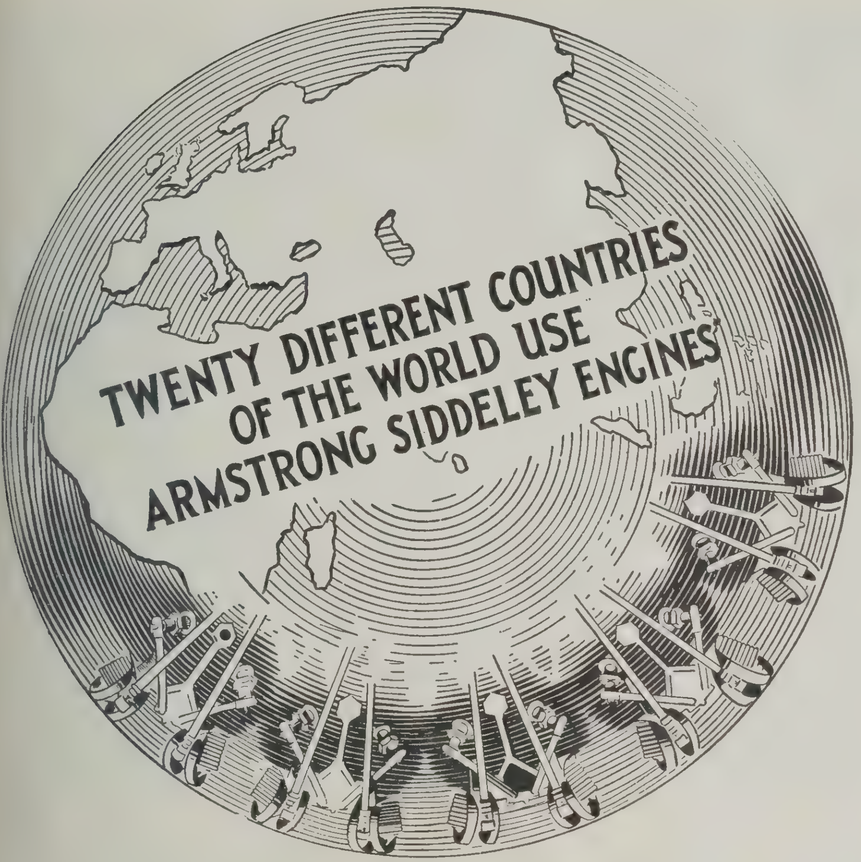
MIDSHIP SECTION
SHOWING SHELL PLATING
FIG I


DORSAL
¾" × ¾" = 18 SWG SHELL ANGLES (CONTINUOUS)
18 SWG INTERCOSTAL PLATE
⅝" × ⅝" = 18 SWG FACE ANGLES
⅝" × ⅝" = 18 SWG SHELL ANGLE (CONTINUOUS)
SWG INTERCOSTAL PLATE
⅝" × ⅝" = 20 SWG FACE ANGLE
2½
1½" × ¾" = 18 SWG SHELL STIFFENING ANGLE BETWEEN FRAMES (SEE FIG V)
8"
3½
⅝" × ⅝" = 18 SWG FACE ANGLE
20 SWG INTERCOSTAL PLATE
¾" × ¾" = 18 SWG (CONTINUOUS) SHELL ANGLE
A
¾" × ¾" = 16 SWG ANGLES
18 SWG VERTICAL KEEL PLATE (CONTINUOUS)
CHINE BAR
1¼" × 1¼" = 16 SWG
1½" × ¾" = 16 SWG SHELL STIFFENING ANGLES (SEE FIG V)
1'6"
6"
¾" × ¾" = 18 SWG ANGLE
18 SWG SIDE KEELSON (INTERCOSTAL)
¾" × ¾" = 18 SWG SHELL ANGLE (CONTINUOUS)
¾" × ¾" = 16 SWG KEEL ANGLES

LONGITUDINAL MEMBERS
FIG. II


DORSAL CONNECTION SEE FIG. VII
⅝" × ⅝" = 18 SWG SHELL ANGLE
2½"
18 SWG DECK BEAM EDGE FLANGED ½"
18 SWG BRACKET
TREBLE RIVETED LAPS COMBINED WITH STRINGER CONNECTIONS
3½" DEEP = 18 SWG WEB
½" FLANGED EDGE
¾" × ¾" = 18 SWG SHELL ANGLE
SIDE GIRDER CONNECTIO SEE FIG VI
½" DIA FLANGED LIGHTENING HOLES
18 SWG BRACKET
DOUBLE RIVETED LAPS
⅝" × ⅝" = 18 SWG DOUBLE ANGLES
1" × ⅝" = 18 SWG DOUBLE ANGLES
18"
18 SWG FLOOR PLATE
¾" × ¾" = 16 SWG SHELL ANGLE
18 SWG CHANNEL STIFFENERS

MAIN FRAME.
FIG III.



WHY?

Because their world-wide reliability has been proved by Cobham and Koppen.

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Because interchangeability and standardisation of parts is a feature of this range of engines.

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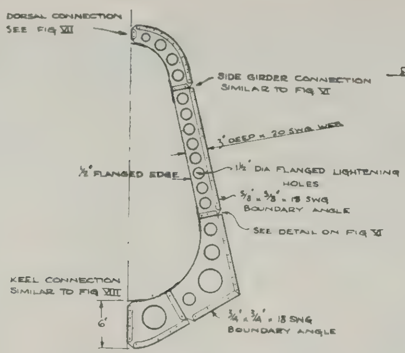

DORSAL CONNECTION SEE FIG VII
SIDE GIRDER CONNECTION SIMILAR TO FIG VI
3" DEEP × 20 SWG WEB
½" FLANGED EDGE
1½" DIA FLANGED LIGHTENING HOLES
⅜" × ⅜" × 18 SWG BOUNDARY ANGLE
SEE DETAIL ON FIG VI
KEEL CONNECTION SIMILAR TO FIG VIII
6"
¾" × ¾" × 18 SWG BOUNDARY ANGLE

WEB FRAME AFT OF REAR STEP

FIG IV

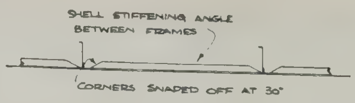

SHELL STIFFENING ANGLE BETWEEN FRAMES
CORNERS SNAPED OFF AT 30°

FIG V

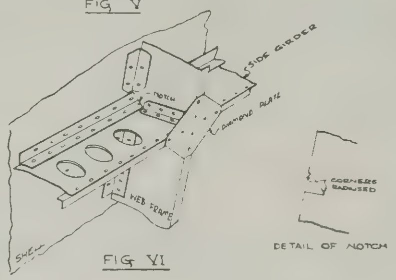


FIG VI

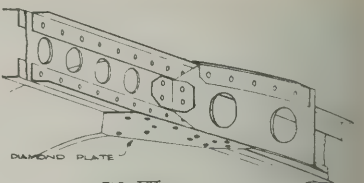


FIG. VII

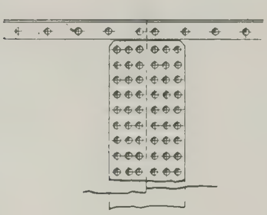


FIG IX

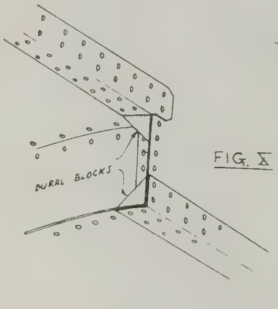


FIG. X

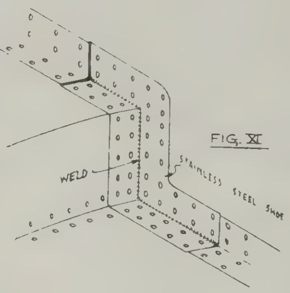


FIG. XI

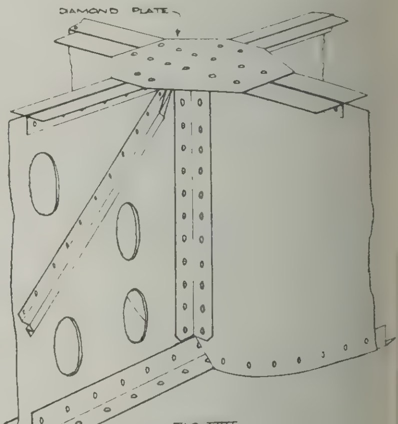


FIG. VIII

A tiny notch may be filed in the edge of the rivet hole into which the head may form, thus locking the rivet.

The second method is to build the step in the more orthodox manner shown in Fig. XI covering the corners with cap pieces welded up from non-corrodible steel sheet. These fittings should be well stove enamelled, the joints being made up with tacky enamel or varnished fabric Stainless steel rivets should if possible be used in order to reduce the number of points of contact of varying metals on the more exposed outer surface.

The third method is similar to the second except that thin aluminium alloy castings are used instead of stainless steel. Such castings should be thoroughly examined for faults and great care should be taken in riveting to prevent cracks developing.

With the exceptien of hatchways or cockpit openings the remainder of the detail design presents no particular difficulties. Any large openings in the shell create points of great weakness in the longitudinal strength of a hull and adequate compensation must be provided. The skin of the boat at any such openings should have doublings fitted, especially at the corners. A main longitudinal girder should be arranged to run along near the edge of the openings on each side and it must not only be strengthened at the openings themselves but tapered away in strength for some distance at the ends of each opening.

Strong transverse bridge pieces or strengthened frames should be placed at each end of any opening to which such broken members as the dorsal may be anchored. Lastly the edge of the opening should have a coaming angle well riveted to it all the way round. Fig. XII represents a cockpit or hatchway constructed in this manner.

Though it is not strictly a part of the boat structure, the flooring of the cabin portion deserves mention and unless it is borne in mind during the early stages of the design considerable difficulty may be met with when the time comes for fitting it. It will be seen in Fig. III that the floor portion of the web frame runs straight across from side to side. Double wide flanged angles are riveted across the top edge and on these the flooring rests. The flooring must be very readily portable for inspection purposes and should give ample ventilation of the inner bottom of the boat.

Though some designers favour simple, closely-spaced wooden battens or duralumin channels bolted to the frames, others use corrugated or pyramid plate in duralumin on aluminium stiffened underneath with channels. These plates are in such sized sections that they may be entirely unshipped through the hatchways and they are fastened to the frames with quick-release catches or bolts.

The Restrictions of Duralumin on Constructional Design.

The heat treatment of duralumin is now getting to be well understood in all aircraft works and the differences between annealing at 360°C. and heat treatment at 480°C. are realised. Since the design of a hull is alone being considered, the practical problems of these treatments will not be discussed but only those points which affect the design.

The designer must always remember the limitations of h material and not expect the impossible from the workma

Whenever shaping and beating are required the metal mu be annealed. And after working, it must be restored strength by heat treatment.

During the soft phase through which the metal pass following heat treatment it is quite as pliable as after annea ing. But this phase lasts only an hour or two before a hardening sets in.

A very great saving will be effected by recognition of th fact in designing units as simple as possible. With caref design there are many units on which all shaping could completed within that hour and thus annealing would n be required for them. Instead of it being the usual thi for all parts to be annealed it should be reserved for spec cases.

The parallel in shipbuilding is the use of the plate furna for oxter, propellor boss and stem foot plates only.

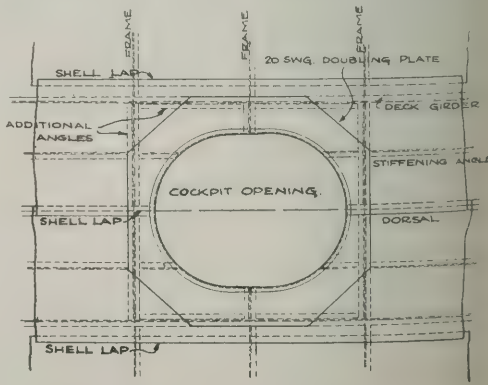
As metal flying-boat building passes from an experimen to a production basis this will become increasingly i portant, and those designers who think in terms of fantas shapes with elaborate flares and curves will find themselv outclassed by the more economical methods of their rivals

Steel Fittings.

Steel fittings taking towing gear, under centre-secti struts and the tail unit must be made of the stainle variety.

Since they are likely to be highly stressed they must bedded on to sufficiently stiff and large duralumin doubli plates to spread the stress efficiently. These doublir should be in two or more laminations, stepped up in s and riveted to the hull skin over frames.

The steel fittings may then be bolted through, with bolt heads bedding into some stiffening angle inside.



STIFFENING FOR COCKPIT

ANOTHER Cirrus-Avian has flown from England to Australia. This time the Avian carried a pilot and passenger—Capt. Lancaster and Mrs. Keith Miller. Their journey occupied 32 flying days from London, averaging seven hours daily at 70 miles per hour. Thus the Avian adds still another success to its long list of remarkable achievements.

The flight is a wonderful feat in itself, but the load the machine carried puts it in a class by itself.

The Avian weighed 900 lbs. and its load 880 lbs. This means that for approximately 13,000 miles it carried practically its own weight. Comment is needless.

Ask for details of the Avro "Avian" the world's best light aeroplane.

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Riveting.

The following sizes are in common use :—

Thickness of plates to be joined.	Dia. of rivet.
12-14 s.wg.	3/16in.
16 s.w.g.	5/32in.
18-20 s.w.g.	1/8in.

Spacing.

It is usual to pitch the rivets 4 dias. apart in all watertight work, such as laps and butts of shell, attachment of shell to frames, stringers, etc., and in important structural members as keel, and keelson butts, floor plate and frame web butts. Elsewhere a spacing of 8 dias. is used.

Butts, Laps, Etc.

Owing to the relatively lower shear strength of duralumin compared with steel, riveted laps cannot be of quite the same proportions. The centre line of rivets should never be nearer to the edge of plate than 2 dias., and rows of rivets should be 3 dias., centre to centre.

Butts and laps of keel and keelsons should be treble riveted, and butts and edges of shell plating, laps and butts of floor plates and frame webs double riveted. From thi it will be seen that the following widths of butt straps an laps hold :—

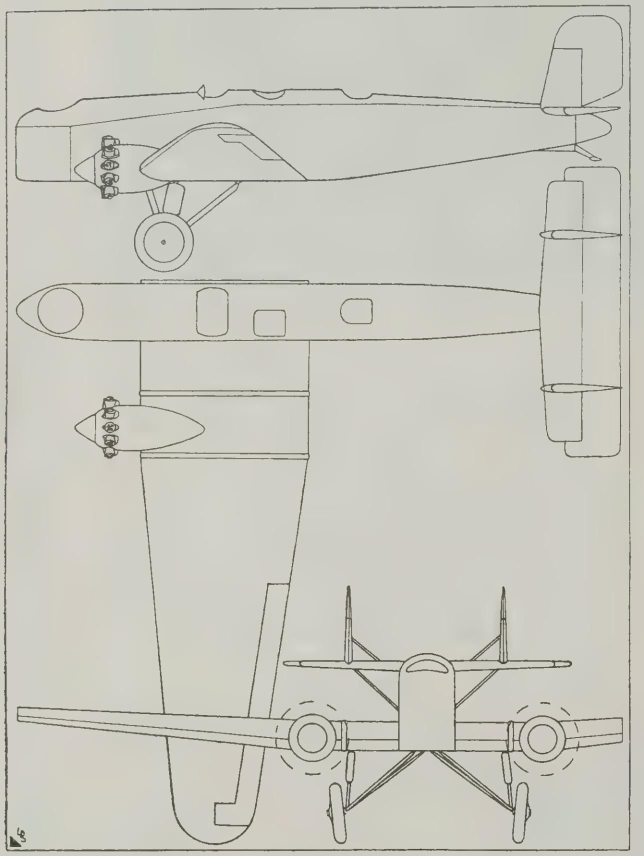
Thickness of Plating	Diameter of ivet	Width of Lap			Width of Strap		
		Single	Double.	Treble.	Single.	Double.	Treble
14	3/16"	3/4"	1 5/16"	1 7/8'	1 1/2"	2 5/8"	3 3/4'
16	5/32"	5/8"	1 3/32"	1 9/16"	1 1/4"	2 3/16"	3 1/8'
18—20	1/8"	1/2'	7/8"	1 1/4"	1"	1 3/4"	2 1/2

Butt straps should be at least as thick as the plates th join. Chain riveting should be used everywhere except i flanges of angles where the width of flange may sugge reeling. Owing to the thin materials used, countersinkin is not found satisfactory.

A precaution which the designer should take is to arran all seams and laps as near to stringers or frames as possible. This will in some measure prevent stretchin during hammering up and will stiffen the plating again drumming.

NEW AIRCRAFT.

The Junkers S-36.



Made by The Junkers Flugzeugwerke A.G., Dessau. Mail carrier.

Wings.—Low wing monoplane of standard Junkers duralumin construction. Two wing roots of parallel chord built into fuselage and extending to engine mounts. Outer wing sections taper markedly to tips. Narrow chord horn-balanced ailerons inset from wing tip.

Fuselage.—Rectangular section, standard Junkers duralumin construction.

Tail.—Monoplane horizontal surface of inverted camber type mounted on top of fuselage and braced below by struts. Horn-balanced one piece elevator. Twin fins and balanced rudders above tail plane, and one small central rudder below tail.

Undercarriage.—Split axle type. One pair of Vees, carrying stub axle and wheel hinged to each side of bottom of fuselage. One telescopic strut on each side running from stub axle to wing just inside of engine mount.

Power Plant.—Two Jupiter engines (420 h.p.) in streamlined nacelles projecting well ahead of leading edge, one on each side.

Accommodation.—One open cockpit in extreme nose of body. One side-by-side cockpit for two (presumably pilot and mechanic) above wing. One open cockpit well behind wing. There is apparently a large amount of space for the stowage of mails both in front of and behind the pilot's seat.

Dimensions.—Span 20.14 m. (66 ft. 7 in.), Length 11.4 m. (37 ft. 6 in. Height over all 4.6 m. (15 ft. 1 in.), Wing area not given, bu approximately 31 sq. m. (335 sq. ft.).

Weights and Looadings.—No data available.

Performance.—No data available.

The Mohawk Pinto.

Made by The Mohawk Aircraft Corporation, Minneapolis, Minnesot U.S.A. Two-seater light monoplane.

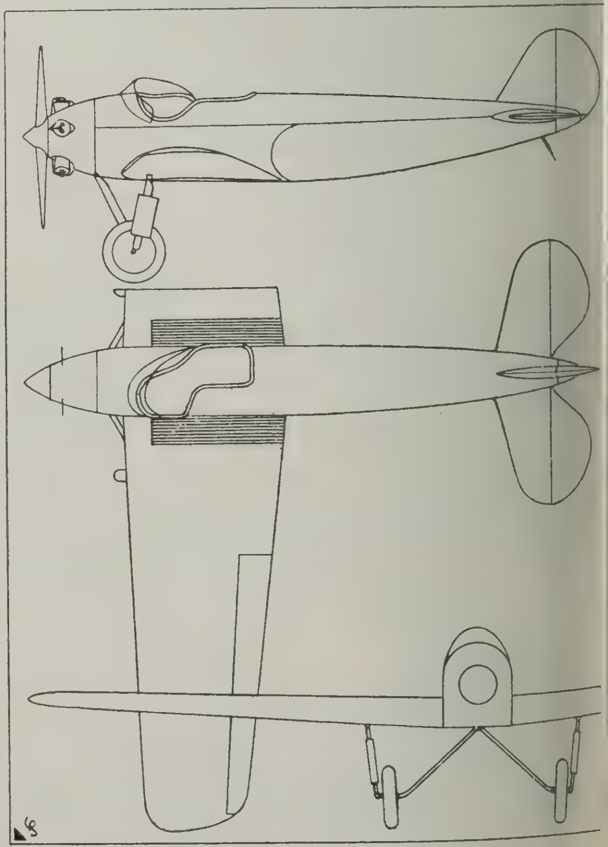
Wings.—Tapered section and chord, cantilever type, fixed at botto of fuselage. Box section spars with spruce flanges and two-pl mahogany webs. Ribs of three-ply with spruce capping stri Spruce compression ribs, and double (top and bottom) drag wire Leading edge covered with mahogany three-play. High aspe ratio "Frieze" type ailerons, operated by torsion tubes insid wing.

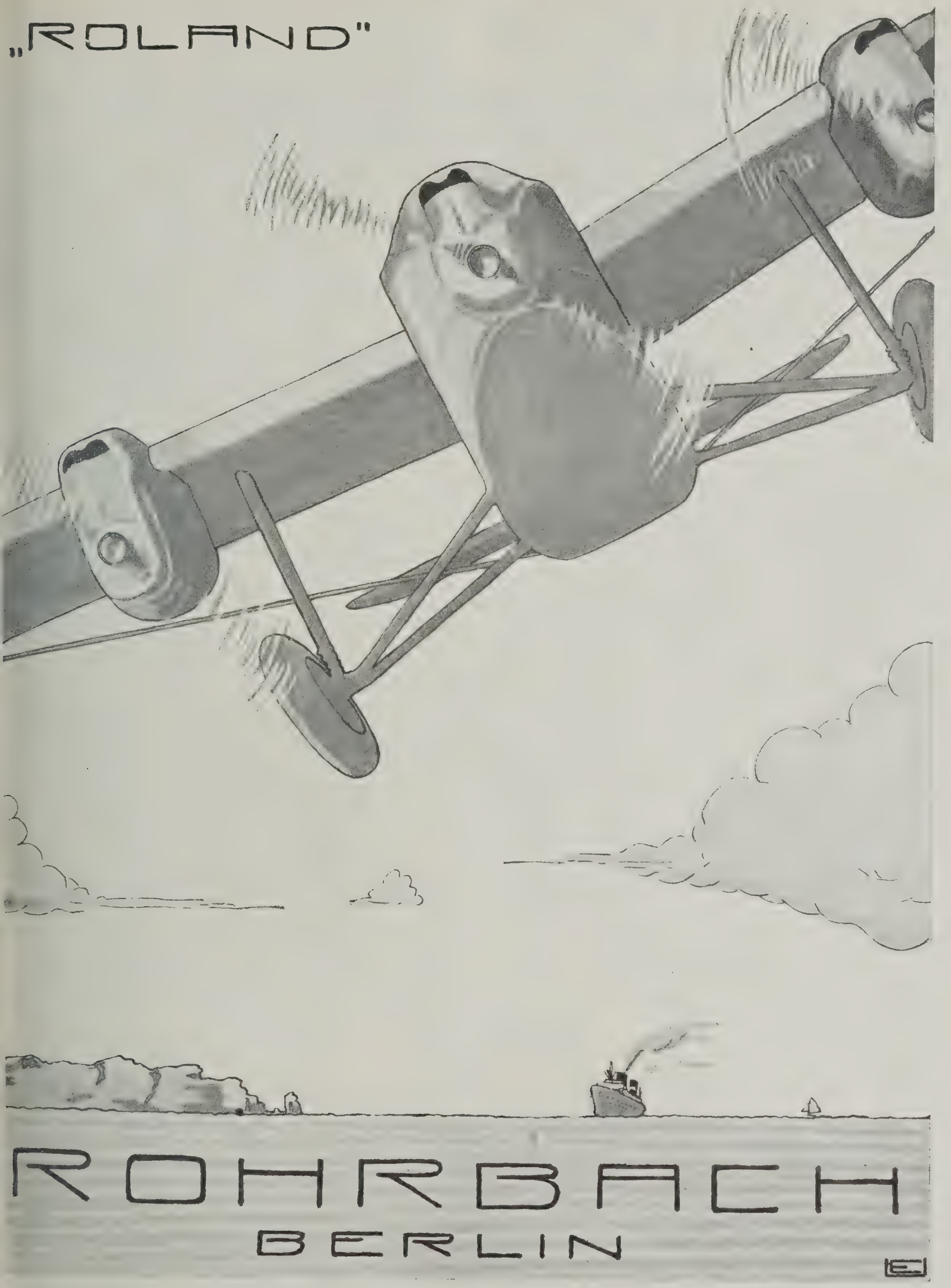
Fuselage.—Rectangular section. Welded steel tube construction.

Tail Unit.—Of normal form and arrangement, but entirely free external bracing. No constructional data available.

Undercarriage.—Split axle type. Two steel-tube Vees are hinge below the centre line of fuselage and each carries a stub ax and wheel. Outside each wheel is a telescopic leg running up the front wing spar. This leg has hydraulic shock-absorbing gea Tail skid is a laminated spring.

Power Plant.—One 60 h.p. Detroit "Air Cat" five-cylinder air-cool radial. Gravity fuel tank in top of fuselage behind engine.





LOOKING AHEAD!

ooner or later; some day the ordinary wood nd fabric aeroplane will be replaced by the ll-metal aeroplane.

emember that a thousand years ago mankind ad built ships from wood—until the XIX entury. And then, nearly from one day to he other, the iron ship replaced the old craft.

It will not take a thousand years to replace wood and fabric by light metal in aircraft building.

Several good aircraft constructed in light metals are already in service. The leader of all of them is the three-engined passenger aeroplane **ROHRBACH-ROLAND.**

Accommodation.—Two staggered seats in one open cockpit. The pilot's seat is forward and on the port side. A tool locker is fitted behind the pilot's seat, and there is a separate baggage compartment. Dual control may be fitted if required.

Dimensions.—Span 30 ft. 6 in. (9.3 m.), Length 22 ft. 0 in. (6.7 m.), Height 6 ft. 3 in. (1.9 m.), Wing area 124 sq. ft. (11.5 sq. m.).

Weights and Loadings.—Weight empty 700 lbs. (318 kg.), Fully loaded 1,200 lbs. (545 kg.), Wing loading 9.7 lbs./sq. ft. (47.4 kg./sq.m.), Power loading 20 lbs./h.p. (9.1 kg./h.p.).

Performance.—Max. speed 110 m.p.h. (177 km.h.), Cruising speed 90 m.p.h. (145 km.h.), Landing speed 35 m.p.h. (56 km.h.), Climb from sea level 800 ft./min. (244 m.), Cruising endurance 4 hours (*Aero Digest, Dec.*, 1927.)

The Potez Type 32.

Made by Aeroplanes Henry Potez, 14, Rue de Marignan, Paris. (For light passenger-carrying service.)

Wings.—High wing monoplane, strut braced. Wing in three sections on timber spars. Rectangular plan form. Long, narrow chord ailerons. Bracing struts of steel tube.

Fuselage.—Timber framed and plywood covered.

Tail.—Triangular fixed tail plane, adjustable in the air. Horn balanced elevators and rudder.

Undercarriage.—Cross-axle, divided and hinged to tubular pylon below fuselage. Side Vee members with front leg telescopic. Compression rubber springing.

Power Plant.—One Salmson A.B.9 air-cooled radial engine, 230 h.p. Engine mount detachable. Fuel tanks in fuselage fitted with jettison valves.

Accommodation.—Pilots' cockpit (two seats side-by-side) below leading edge of wing, with large Vee-pointed wind screen right up to wing. Dual controls. Baggage compartment below cockpit. Cabin for four passengers behind pilots' seats. Lavatory and after luggage compartment behind cabin.

Dimensions.—Span 14.5 m. (47 ft. 5 in.), Length 10.15 m. (33 ft. 2 in.), Height 4.0 m. (13 ft. 1 in.), Wing area 35 sq. m. (375 sq. ft.).

Weights and Loadings.—Power plant unit 430 kg. (947 lbs.), Aircraft structure 520 kg. (1,145 lbs.), Total empty weight 950 kg. (2,092 lbs.), Fuel and oil 200 kg. (440 lbs.), Pay load 500 kg. (1,100 lbs.), Weight loaded 1,750 kg. (3,850 lbs.), Wing loading 50 kg./sq. m. (10.25 lbs./sq. ft.), Power loading 7.6 kg./h.p. (16.8 lbs./h.p.).

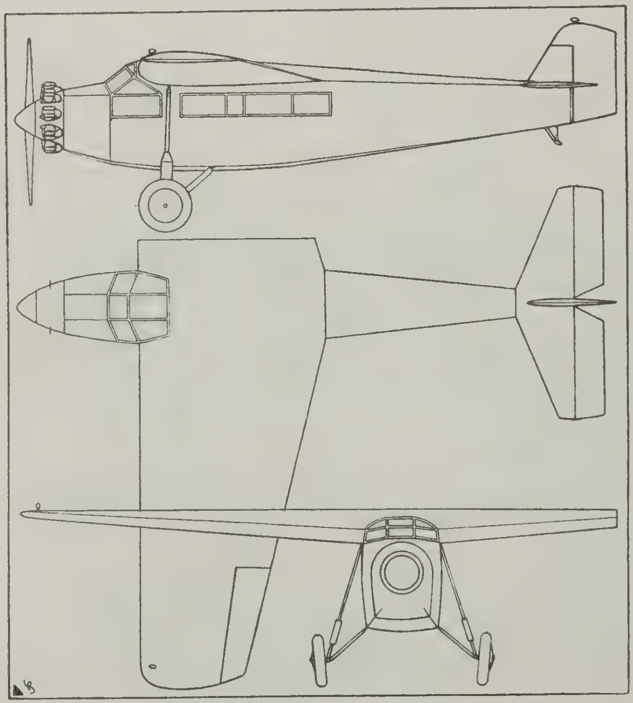
Performance.—Max. speed 180 km.h. (112 m.p.h.), Ceiling 4,500 m. (14,750 ft.), Range at 150 km.h. (93 m.p.h.), 670 km. (415 miles) = 4⅓ hours.

The Ryan Lone Eagle.

Made by The Ryan Mechanics Monoplane Co., Los Angeles, California. Four passenger cabin monoplane, built throughout of welded steel tube.

Wings.—Tapered chord, cantilever, high wing type. Spars are Warren truss girders welded from steel tubes. The boom tubes change from 1¾ in. O.D. x 3/32 in. thick at body to ¾ in. O.D. x 20 G. at tip. Successive tubes are telescoped into end of preceding tube and a welded fish-tail joint made. The leading edge and the front spar are at right angles to the fuselage centre line. The rear spar and trailing edge both slope forward towards tip. Double drag-bracing in plane of both top and bottom booms is used. Ribs are welded-tube Warren girders welded to spars. Forty-one such ribs of a total weight of 8 lbs. are used. Very small ailerons, unbalanced.

Fuselage.—Rectangular section, welded tube construction rigidly braced throughout.



Tail Unit.—Tail plane is a triangle with cut-off corners. Eleva flaps rectangular. Triangular fin and large horn-balanced rud Welded tube structure with no external bracing.

Undercarriage.—Split-axle type. A pair of Vees is hinged to lower edge of the fuselage and each Vee carries a stub-axle an wheel. A telescopic leg runs from just inside each wheel to of the fuselage below the front wing spar. Rubber discs in pression shock absorbers. Sauzedde brakes and wheels.

Power Plant.—One Wright "Whirlwind" (J4-B) engine of 230 carried on a welded steel mount made of square tube. A h starting crank projecting from side of cowling is fitted. tanks (43 U.S. gallons each) fitted in wing and feeding by grav Westinghouse "Micarta" Airscrew.

Accommodation.—Pilot's seat ahead of and below wing and pletely enclosed by glass panels in front and celluloid roof lig Cabin 8 ft. (2.4 m.) x 5 ft. 5 in. (1.6 m.) x 3 ft. 6 in. (1.1 with two side-doors, below wing two seats for four passeng A cargo space of 13½ cub. ft. (0.4 cub. m.) is behind the cabi

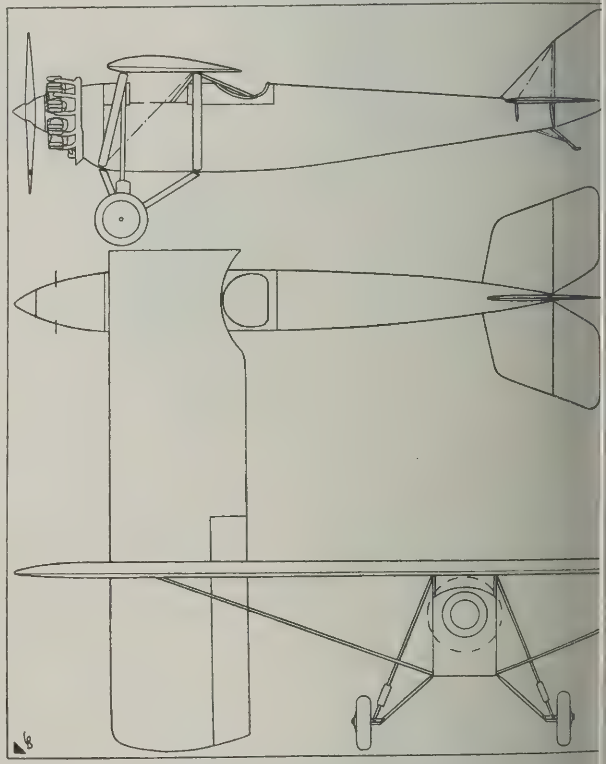
Dimensions.—Span 37 ft. 6 in. (11.4 m.), Length 29 ft. 3 in. (6.82 Height 9 ft. 0 in. (2.74 m.), Wing area 262 sq. ft. (24.2 sq. m

Weights and Loadings.—Weight of wing structure 354 lbs. (161 k Weight of tail unit 58 lbs. (26 kg.), Weight of machine em 2,080 lbs. (945 kg.), Pilot 160 lbs. (72.5 kg.), Fuel and oil 612 (278 kg.), Pay load 630 lbs. (286 kg.), Loaded weight 3,475 (1,575 kg.), Wing loading 13.25 lbs./sq. ft. (65 kg./sq. m.), Po loading 15.1 lbs./h.p. (6.85 kg./h.p.).

Performance.—Max. speed 125 m.p.h. (201 km.h.), Cruising speed m.p.h. (169 km.h.), Landing speed 40 m.p.h. (64 km.h.), Ra 7 hours = 735 miles (1,185 km.).

Price.—$12,500 (£2,600).—(*Aviation, Feb.* 20, 1928.)

The Temple Monoplane.



Made by The Texas Aero Corporation, Temple, Texas, U.S.A. L mail carrier.

Wings.—Rigidly braced high wing monoplane. U.S.A. 27 aer section. Solid spruce spars, spliced at centre line of fusel Warren girder spruce ribs. Double (top and bottom) drag bra Narrow chord unbraced ailerons with welded steel tube frame

Fuselage.—Welded steel tube frame (Chrome-Molybdenum) wire br behind cockpit.

Tail.—Welded steel tube frame. Tail plane adjustable in the All control surfaces unbalanced.

Undercarriage.—Split axle type. Stub axles carried by Vees hi to bottom edge of fuselage. Telescopic strut from inside wh to joint of front spar and top fuselage longerons. Compres rubber springing.

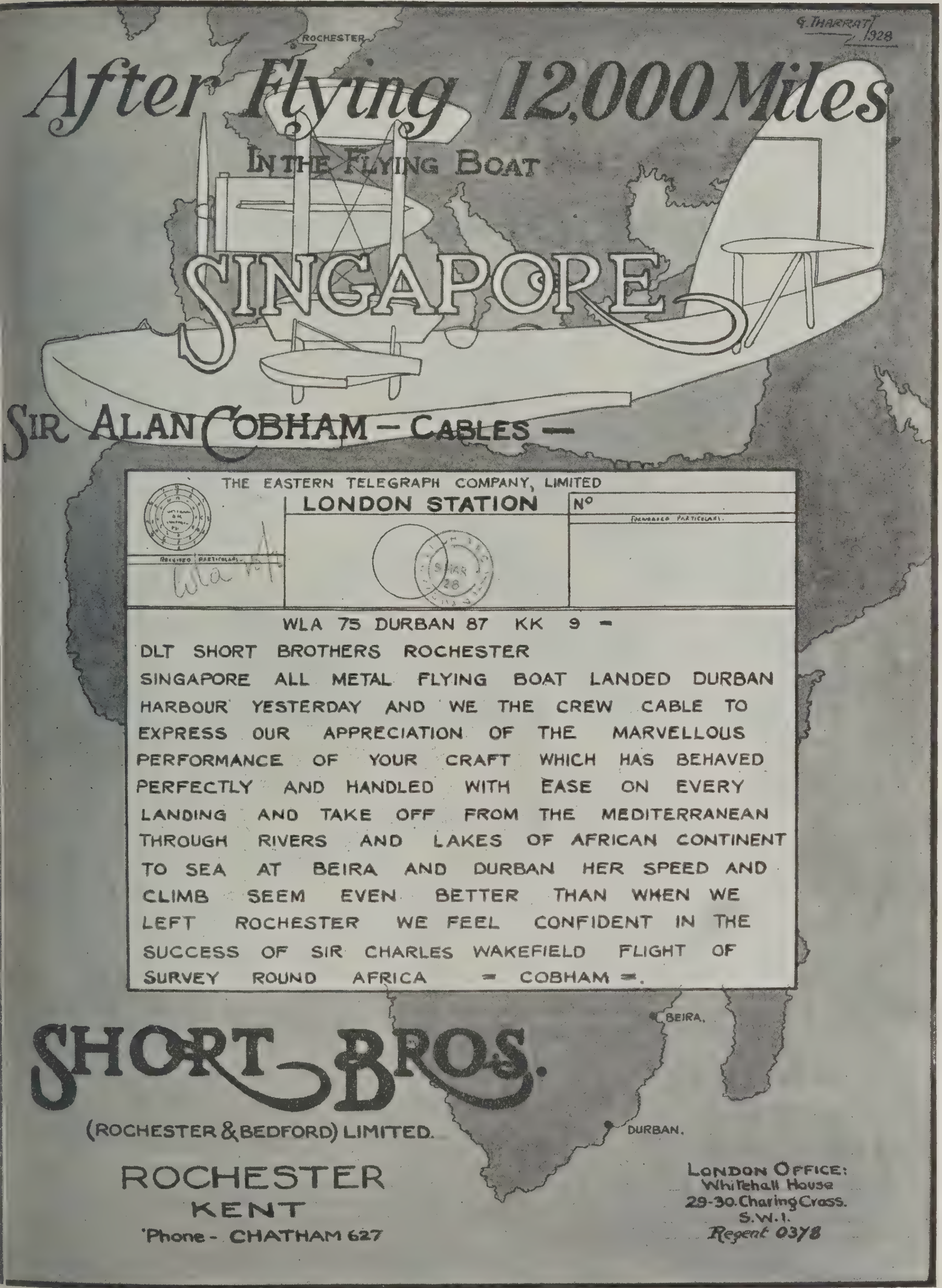
Power Plant.—One Wright Whirlwind (J-5) engine 230 h.p. on tachable mounting. Two fuel tanks (gravity) in wings.

Accommodation.—Open cockpit for pilot behind wing, pilot's eye with chord and giving view forward below wing. Open mail partment below wing.

Dimensions.—Span 39 ft. 4 in. (12.0 m.), Length 25 ft. 10 in. Height 8 ft. 3 in. (2.51 m.), Wing area 225 sq. ft. (21 sq. m

Weights and Loadings.—Weight empty (approx.) 1,100 lbs. (500 Fuel (50 U.S. galls.) 310 lbs. (142 kg.), Pay load 567 lbs. Weight loaded 2,250 lbs. (1,025 kg.), Wing loading 10 lbs. (49 kg./sq. m.), Power loading 9.75 lbs./h.p. (4.5 kg./h.p.).

Performance.—No data given.—(*Aviation, Feb.* 27, 1928.)



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NEW ENGINES.

The Hispano Suiza 600 h.p. W Type.

Made by The Societe Francaise Hispano-Suiza, Bois Colombes, Seine et Oise, France. Twelve-cylinder W type water-cooled, developed from the 500 h.p. type 50-12 G.B. by increasing the stroke 20 m/m.

Cylinders.—Three aluminium blocks each of four cylinders with screwed-in steel liners with closed tops. Bore 140 m/m., stroke 170 m/m.

Compression Ratio.—6/1.

Pistons.—Aluminium. Interchangeable with those of the 300 h.p. eight-cylinder, and the 500 h.p. twelve-cylinder engines of this make.

Valve Gear.—Standard Hispano-Suiza type with cams bearing directly on tablets on valve stems

Connecting Rods.—No data available.

Crankshaft.—One piece four-throw type. No details available.

Crankcase.—Two-piece light alloy casting, split on crankshaft centre line.

Auxiliary Gears.—All carried from rear end of crankshaft.

Carburettors.—Three horizontal Zenith type, each feeding one block of four cylinders arranged two between port and centre block, and one between starboard and centre block.

Airscrew Drive.—Direct.

Output.—609 h.p. at 2,010 r.p.m.

Weight Dry.—410 kg. (902 lbs.) without airscrew hub.

Fuel Consumption.—0.215 kg. (0.472 lbs.) per h.p. hour at 536 and 1,910 r.p.m.

The Ford Engine.

Made by The Ford Motor Co Two-cylinder opposed air-cooled e for light aeroplanes.

Cylinders.—Steel barrels screwed into heads of cast "Y" Bore 4½ in. (114 m/m.), stroke 4½ in. (114 m/m.).

Valve Gear.—Two overhead valves per cylinder operated by en pushrods and rocker arms.

Pistons.—Forged magnesium alloy.

Connecting Rods.—Steel, made in two parts, bored for lightness the middle and butt-jointed by electric welding.

Crankshaft.—No data as to construction. Runs in roller beari rear end, white metal bearing at front end.

Crankcase.—Aluminium casting. No data as to construction.

Auxiliary Gears.—Oil pump and valve gears contained in casing ing front cover of crankcase

Airscrew Drive.—Direct.

Overall Dimensions.—35 in. (880 m/m.), over cylinder heads, (635 m/m.) long.

Output.—36 b.h.p. at 1,800 r.p.m.

Fuel Consumption.—3 gallons per hour.—(*Aviation, Feb. 27, 1928*

BRISTOL JUPITER ENGINE DEVELOPMENTS.

During the past year the Engine Research and Development Department of the Bristol Aeroplane Co. Ltd. have made extensive improvements in and developments of the well-known Jupiter engine, with the result that this type of engine is now available in a variety of types suitable for use in both Service and Civil aircraft for a very wide range of uses.

The following brief account describes the nature of the improvements and gives a complete list of the types of Jupiter engine which are now available.

Cylinders and Pistons.—An improved type of cylinder and piston, to cope with the increased r.p.m. of the geared and supercharged engines, has been very fully tested out on the single cylinder test bed.

The general design follows the well-known Jupiter cylinder construction, with additional cooling fins, and the incorporation of triple valve springs and ball bearing rocker gear.

The improvements have been included in the whole series, making them interchangeable as regards cylinder components.

Gear-Driven Supercharger.—The supercharger as applied to the Jupiter VII has been developed to maintain ground level power at 12,000 ft., with an increase in weight due to the blower of only 40 lbs.

The gearing and drive for this blower has been the subject of most careful work, and before being released, has been run for some thousands of hours on a specially designed test bed.

This engine is specially intended for high performance scouts and gives remarkable improvement on the performance at altitude, the improvement over the Series VI on similar machines being over 20 per cent. on climb and 10 per cent. on speed.

A valuable feature in connection with the design of the Series VII supercharged engine is that it is interchangeable as regards installation with the Series VI.A.

Reduction Gear.—The Bristol Company have acquired the patent rights for Great Britain for the well-known Farman Bevel Reduction Gear, and this gear has been applied to the Jupiter engine with considerable success.

Hundreds of hours' running have been undertaken on the Test Bench, and some eight different types of machines fitted with these engines have been tested out with excellent results, both as regards engine and machine performance.

The gear as applied to the Jupiter engine has proved very robust, efficient and silent.

Bristol Triplex Carburettor.—Very extensive flight tests have been carried out and detailed improvements made to this carburettor, to cope with the increased speed of the geared and supercharged engines.

Exhaust Manifold Collector Rings.—The increased engine r.p.m. on the various engines has necessitated modifications to the earlier types of ring, and extensive tests have been undertaken. As a result an entirely new design of ring has been produced, in back pressure has been reduced to under ½ lb. per square and the ring temperatures brought down to an absolutely safe

Two types of ring are at present available, one for the Series ungeared engines, and one for the geared engines; both these have been type tested and are in production

Available Types of Jupiter Engines.

In addition to the standard type, the Jupiter engine is now able fitted with a Gear-Driven Supercharger, or with a Reduction making it suitable for all types of installations.

The Series VI.A consists of the well-known Series VI engine a number of detailed modifications and improvements, as a of the last three years' work. All these improvements are matically incorporated in the new engines.

The list hereafter gives the outputs of the various types. performances quoted are the guaranteed minimum figures standard temperature and pressure conditions, and with Standar Ministry Service Fuel, 80 per cent. Shell Aviation, plus 20 per Benzol.

Direct Drive.

Series VI.A.—Standard Service Engine 6.3 : 1 Compression.
Throttled on ground 415 b.h.p. at 1,700 normal r.p.m.
Rated at 5,000 feet 415 b.h.p. at 1,700 r.p.m.
Maximum permissible r.p.m. 1,870

Series VI.A.M.—General Purpose Engine 5.3 : 1 Compression.
Rated at ground level 440 b.h.p. at 1,700 normal r.p.m.
Maximum permissible r.p.m. 1,870.

Series VI.A.L.—Commercial Engine 5 : 1 Compression.
Rated at ground level 420 b.h.p. at 1,700 normal r.p.m
Maximum permissible r.p.m. 1,870.

Gear-Driven Supercharger.

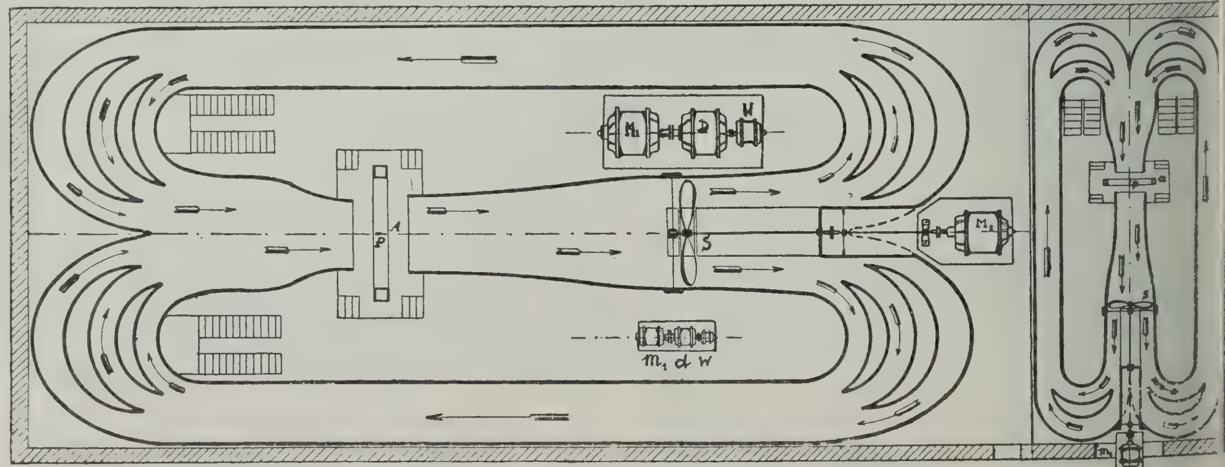
Series VII.—Standard Service Engine 5.3 : 1 Compression.
Throttled on ground 375 b.h.p. at 1,775 normal r.p.m.
Rated at 12,000 feet 420 b.h.p. at 1,775 r.p.m.
Maximum permissible r.p.m. 1,950.

Reduction Gear 2 : 1 Ratio.

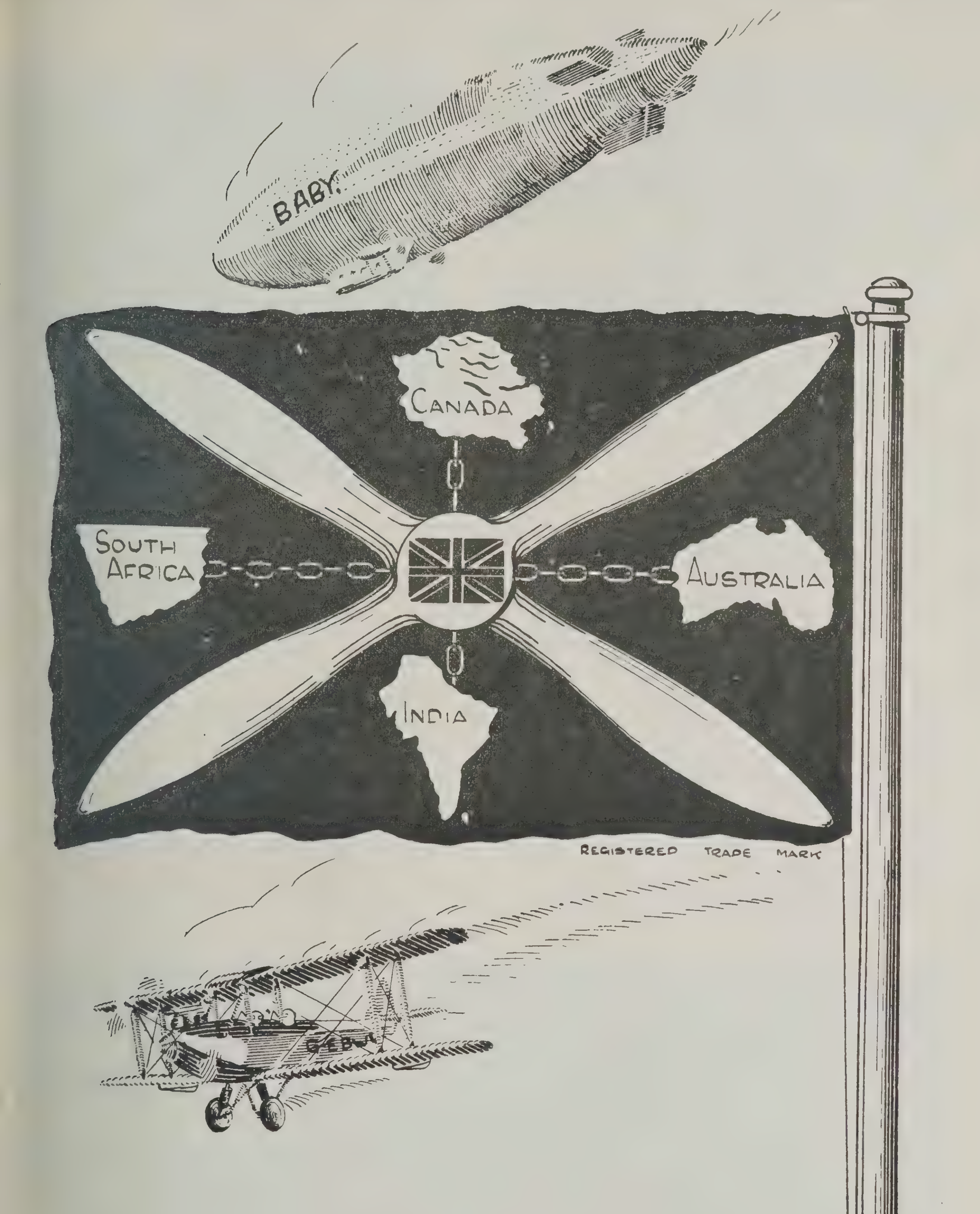
Series VIII.—Standard Service Engine 6.3 : 1 Compression.
Throttled on ground at 410 b.h.p. at 2,000 normal engine r.p.
Rated at 5,000 feet 440 b.h.p. at 2,000 r.p.m.
Maximum permissible engine r.p.m. 2,200.

Series IX (Geared 2 : 1).—General Purpose Engine 5.3 : 1 Compre
Rated at ground level 485 b.h.p. at 2,000 normal engine r.p.m
Maximum permissible engine r.p.m. 2,200.

Series XI (Geared 2 : 1).—Commercial Engine 5 : 1 Compression.
Rated at ground level 460 b.h.p. at 2,000 normal engine r.p
Maximum permissible engine r.p.m. 2,200.



Ground plan of the Warsaw Aerodynamic Laboratory's wind tunnel.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NEW AIRCRAFT ACCESSORIES.

A Periscopic Wind-Gauge Bearing Plate.

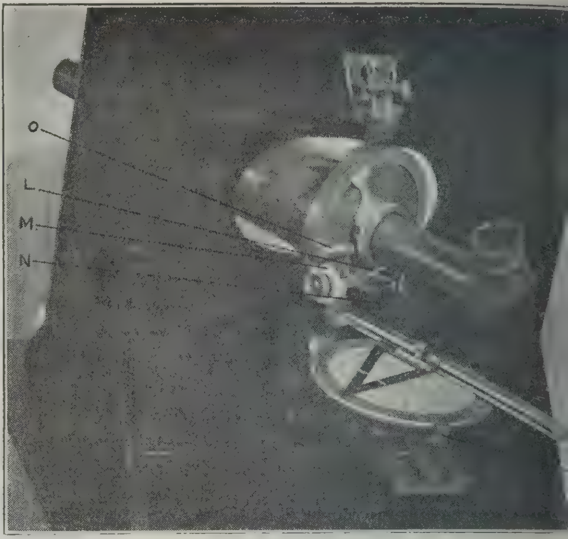
The Wind-Gauge Bearing Plate is an instrument well known to all aerial navigators and of proved value in cases where accurate navigation by means of ground observation is required. It is a grave disadvantage of the ordinary type of instrument that observations can only be made over the side of the aircraft. The consequent exposure of the observer to the wind does not make for accuracy of observation, and in some classes of aircraft such observation presents other difficulties. In flying-boats the shape of the hull may make such observation impossible. In machines with wide fuselages there are often difficulties of a serious nature, and the ordinary instrument cannot be used at all in totally enclosed aircraft.

To overcome these difficulties, Henry Hughes and Son. Ltd., 59, Fenchurch Street, London, E.C.5, have produced the periscopic instrument shown in an illustration. This consists of a periscope giving a bright image over a wide field in an eye-piece (B). This periscope is a sliding fit in a carrier mounted on the side of the aircraft, so that the periscope itself protrudes through the side. This carrier is mounted on vertical pivots, which can be clamped in any desired position, and the periscope may in addition be rotated about its own axis, and is provided with a protractor dial which gives the angle between the line of sight and the vertical—which is determined by the bubble level (O).

Below the periscope mounting is the Wind-Gauge Bearing Plate proper. The drift-bar of this bearing plate is connected to the periscope carrier so that its edge is always parallel to the optical axis of the periscope.

In normal use the periscope is set to point vertically downward, and is then rotated about the vertical pivots of the carrier until the apparent motion of any object on the ground is along the index wire in the eye-piece. This sets the drift bar precisely as it is set by ordinary observation over the side with the usual type, and by the customary methods the wind point may be determined.

In addition, when the drift bar has been set in this way, ground speed may very simply be measured. To do this the periscope is rotated about its own axis to point 26½° forward. A stop watch is started as any convenient object crosses the wire in the eye-piece.



The periscope is then rotated to point 26½° aft, and the stop is stopped as the same object once more crosses the wire. Th so obtained is the time to cover a distance equal to the height aircraft, which is determined from corrected altimeter reading ground speed can therefore easily be calculated.

By marking off this speed from the scale on the drift bar th point is at once given.

TECHNICAL ABSTRACTS.

Aerodynamics.

Technical Note No. 271. The National Advisory Committee for Aeronautics (U.S.A.). Full Scale Drag Tests on Various Parts of Sperry Messenger Airplane. By F. M. Weick.

Report of tests made in the 20 ft. diameter wind tunnel at the Langley Memorial Laboratory on a complete Sperry Messenger aeroplane with wings removed at wind speeds from 50 to 100 m.p.h. The machine was originally mounted in the tunnel for airscrew tests, and the opportunity was taken to make a series of drag tests on it.

In the first place the drag of the complete assembly plus supports was measured. The machine was then disconnected from the supports and held in place—with a small gap—and the drag of supports measured. The undercarriage was then disconnected from the fuselage and attached to the supports, and the drag of the undercarriage determined. The fuselage was then reconnected to the undercarriage and the tail surfaces were removed. The wind shield and the roll of upholstery round the cockpit was next removed. A test was then made with the cockpit covered. The last test of all was made with engine removed and the holes in the cowling smoothly.

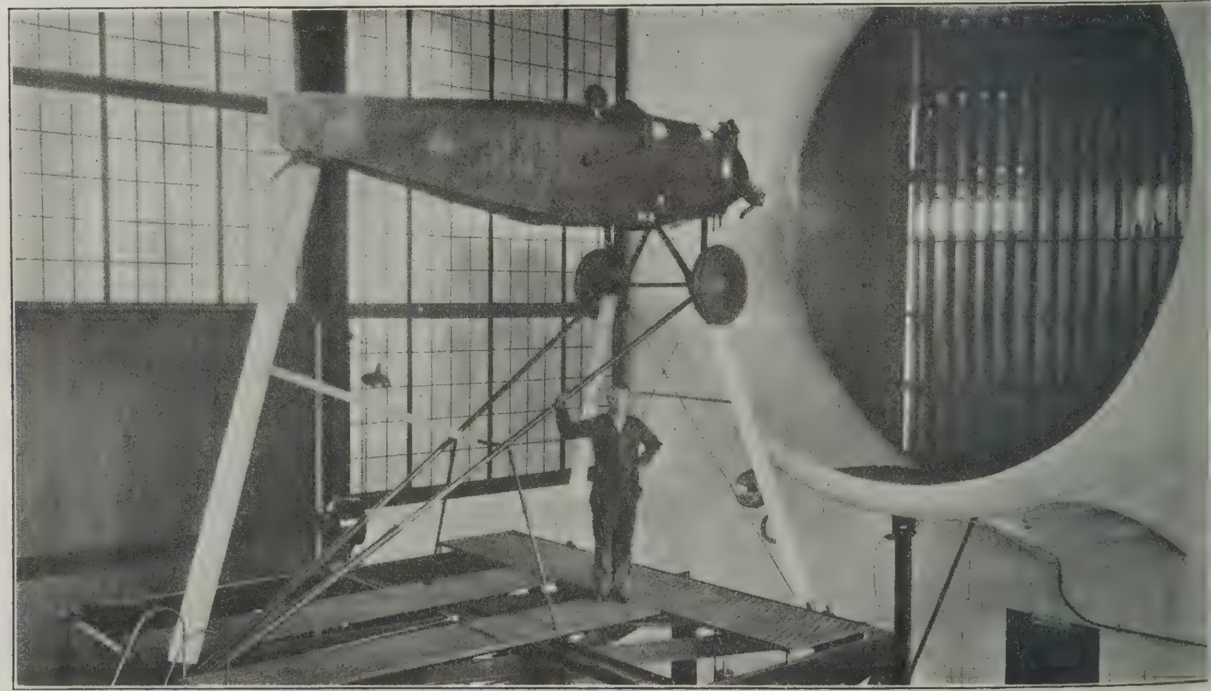
In all tests with the wind shield in place a pilot sat in the c

The drag of the complete assembly, at an air speed of 80 m.p. found to be 65.3 lbs. The fuselage, without engine, or wind scree with cockpit faired, had a drag of 16.0 lbs. (24.4 per cent. of the The engine added 11.3 lbs. (17.3 per cent. of the total), the and wind screen 2 lbs. (3.1 per cent.) each, the tail surfaces (12.3 per cent.) and the undercarriage 26.0 lbs. (38.8 per cent.)

The exceedingly large drag of the undercarriage and of the cylinder air-cooled engine are noteworthy. The undercarriage Sperry Messenger is not abnormally "dirty." Another inte point is the small additional drag caused by the cockpit and screen.

Report No. 273, The National Advisory Committee for Aero (U.S.A.) "Wind Tunnel Tests on Autorotation and the 'Flat By Montgomery Knight.

This report describes force and rotation tests from zero



The fuselage of a Sperry Messenger biplane, with pilot, mounted for test in the 20 ft. wind tunnel, Langl Memorial Laboratory.

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to 90° incidence made on models of both monoplanes and biplanes of three different wing sections (Göttingen 387 F.B., R.A.F. 15, and N.A.C. M.1) in the 5 ft. dia. wind tunnel of the Langley Memorial Aeronautical Laboratory.

Analysis of these tests leads to the following conclusions :—(1) Autorotation below 30° angle of attack is governed chiefly by the characteristics of the wing profile and above that angle chiefly by wing arrangement.

(2) The polar curve of a wing system, and to a lesser degree of accuracy, the polar of a complete aeroplane model, are sufficient for the direct determination of the limits of rotary instability, subject to the limitations of "strip" methods of computation.

(3) A monoplane is incapable of "flat" spinning, unstaggered biplanes have inherent "flat" spinning characteristics, and either positive stagger or upper wing overhang will reduce this characteristic.

It is claimed by the author that the criterion of rotary stability may be expressed with sufficient accuracy for all practical purposes as :—

$$\frac{d\,(Kr)}{d\alpha} < O$$

instead of using Glauert's criterion :—

$$\frac{d\,(K_L)}{d\alpha} + K_D < O$$

where K_R is the coefficient of total resultant force on the aerofoil, and α is the angle of incidence.

Meteorology.

"*The Pilot Chart of the Upper Air.*" *By Commander C. C. Baughman, U.S. Navy.* (*United States Naval Institute Proceedings, February,* 1928.)

In this article the author explains the importance to all aerial navigators of a knowledge of the winds they are likely to encounter on a given journey—particularly on long distance voyages. For a specific journey on a specific day an accurate forecast is required, but in the absence of such a forecast, and more generally for planning an air route, a thorough knowledge of the general weather conditions normally to be expected is of the greatest value. For flying purposes this information should cover upper air as well as surface conditions.

A copy of the Pilot Chart of the Upper Air for the North Atlantic ocean for December, 1927, prepared by the Hydrographic Office of the U.S. Navy Department, is given as a supplement to this article to show the value of the attempts already made to supply such information. This chart covers the North Atlantic from a little South of the Equator to 60° North.

On the chart are shown wind roses indicating the probable strength and frequency of the wind from sixteen compass points at various altitudes (0, 2,500, 5,000 and 10,000 ft.) at a large number of American Coast stations and at a few European stations. Over the ocean itself observations at the surface are alone available in most cases, but roses for surface conditions are given for each area comprised in a square 5° in latitude by 5° in longitude. It is hoped that in the future it may be possible to add roses for higher altitudes over the sea. Average water and air surface temperatures are indicated on the chart and inset charts give normal atmospheric temperatures pressures for the month. Fog areas are clearly indicated, and o back of the chart is much valuable analytic data of weather ditions in the area covered.

The result is that on this one chart is collected practically a available information as to the probability of meeting any one weather conditions in any one place over the area covered i month of December.

For any given route over this area therefore it is possible t dict on what percentage of days in December a head, tail, or wind will probably be found, the probable average speeds of winds, the likelihood of fog, and so forth.

Protection of Light Alloys.

"*Thirteenth Annual Report of the National Advisory Committe Aeronautics,* 1927 (*U.S.A.*)."

The sub-committee on metals for aircraft of the N.A.C.A. carried on investigation of the cause and prevention of intercryst embrittlement of duralumin. Corrosive attack starting at the face and penetrating between crystals may notably embrittle alloy, the surface showing no evidence of the extent of attack the surface.

This kind of attack may be prevented by correct heat trea more particularly by the quenching of the material rapidly than slowly (i.e., in cold water rather than hot water or oil) tog with the use of a satisfactory protective coating. Aging at temperature rather than accelerated aging at high temperature increases the resistance to this attack.

The opinion is expressed that the coating of duralumin with aluminium is the surest type of protection for this materia draws attention to the commercial production of duralum treated ("Alclad" produced by the Aluminium Corporati America).

This is not available in tube form, and although it is immune intercrystalline penetration, the aluminium is subject to ord surface corrosion. Hence further protective coatings must sti considered.

Non-metallic coatings of the "aluminised varnish" or "bitum type—hitherto largely used for the light alloys—cling well on surface. Where such coatings are to be used preliminary trea by the anodic process is advisable to secure adhesion of the va The anodic coating in itself offers some protection but not enou be a real solution.

The chief trouble with coatings of the varnish type is their dency to become brittle and to crack off. Covering the anodic ing with oil or lanolin gives a very effective protection as lo the oil film remains intact. A drawback of such oil coating is inspection does not show if the film remains intact, and re- to a definite schedule is necessary.

A recent development is the production of a rubber cement sticks tenaciously to the metal and can be applied without treatment. The bare rubber breaks down rapidly on exposur must be protected either by mixing aluminium powder with dusting such powder onto the surface while it is yet tacky. type of protection is considered worthy of extended trial and hoped may prove an effective protection even for magnesium.

NEW TECHNICAL LITERATURE.

Aluminium and Magnesium Alloys.

"*Light Metals and Alloys. Aluminium, Magnesium.*" *Circular of the Bureau of Standards N.* 346. *Dec.* 12, 1927. *Price* $1.10. (*Sold only by the Superintendent of Documents, U.S. Government Printing Office, Washington,* D.C.)

This volume of some 300 pages may be considered as a compact and comprehensive guide to the properties of practically all known light alloys, and its scope cannot better be indicated than by quoting the "Abstract" which precedes the work. This reads :—

> "The physical and mechanical properties of aluminium and magnesium and their light alloys, and the variation in properties caused by changing the composition of the alloy, by the presence of impurities, by mechanical working, by changes in conditions of manufacturing operations, and by heat treatment, are given. The selection of data given has been made and the data have been checked, by representatives of the light-alloy industries in order to present reliable data. Equilibrium diagrams for the important alloy systems are given. The metallography, corrosion resistance, and methods of protection against corrosion, the theory of heat treatment, and the application of the alloys to industry, are discussed. A selected and classified bibliography is appended."

The book is divided into separate sections dealing with aluminium and magnesium respectively. These are systematically arranged and deal with the primary metal, its methods of manufacture, and the grades in which it is commercially obtainable. The metallography, chemical and physical qualities, and the technology of working are then discussed. Thereafter specifications of alloys and their qualities are dealt with in a similarly systematic manner.

The work should be of the very greatest value to all who have to use the light alloys for any purpose.

National Advisory Committee for Aeronautics (U.S.A.) Reports :—

No. 247.—"*Pressure of Air on Coming to Rest from Various Speeds.*" *By A. F. Zahm.*

The dynamic pressure of a fluid at a stagnation point on a body in it is usually taken to be equal to $\frac{1}{2}\rho V^2$. This assumes zero compression of the fluid. The effect of compression is negligible at low speeds in air, but becomes appreciable at some of the higher speeds attained by aircraft and airscrews to-day. This report develops formulæ to take account of compression, and tabulates values of dynamic pressure assuming adiabatic compression for air-speeds from zero to 1,000 m.p.h. Allowance for compression increases dy pressure to the extent of nearly 5 per cent. at 300 m.p.h.

No. 262.—"*Friction of Aviation Engines.*" *By S. W. Sparrou M. A. Thorne.*

Discussion of the effects on engine friction losses of: Atmos Temperature and Pressure, Throttle opening, Engine speed, water temperature and Compression ratio. Part II deals wit effect on engine friction of wide variations of piston design.

No. 263.—"*Preliminary Flight Tests of the N.A.C.A. Roots Typ craft Engine Supercharger.*" *By A. W. Gardner and E. G.*

Results of tests made with this supercharger with two di gear ratios on a Liberty-engined D.H.4, and with the higher g a Douglas D.T.2 machine.

The lower gear ratio—1.5 to 1—maintained ground-level intak sure to 12,000 ft., the higher gear—1.94 to 1—to 20,000 ft. No t was encountered with the engine in the tests, and only minor me cal ones with the supercharger.

No. 264.—"*Differential Pressures on a Pitot-Venturi and a Pilot Nozzle over* 360° *Pitch and Yaw.*" *By R. M. Bear.*

Results of tests on two very different types of air-speed in nozzles. The Pitot-Venturi type gave about seven times the pr difference of the Pitot-Static type, and its accuracy as a speed-mea instrument is slightly less affected by large angles of pitch or

No. 266.—"*Air Force and Moment for N20 Wing with Certai outs.*" *By R. H. Smith.*

Results of model tests on a wing with various deformations central section, such as are commonly made to improve the view. All variations tested had an adverse effect on lift and dra made marked changes in the angle of zero lift, and the mome efficient.

No. 267.—"*Drag of Wings with End Plates.*" *By P. E. Hemke*

A dissertation on the effect of fitting vertical shields to the of wings to reduce the induced drag. Methods of calculatin effect of such shields are developed both for monoplanes and planes. An analysis of models tests with tip shields is given sh that the calculations accord with test results, and that the red in induced drag is more than the added drag of the shields.

No. 268.—"*Factors in the Design of Centrifugal Type Injection for Oil Engines.*" *By W. F. Joachim and E. G. Beardsley.*

Results of research carried out at the Langley Memorial Aeron. Laboratory on injection valves for oil engines of the type in the injected fuel is centrifugally sprayed by passing through passages.

THE ROYAL AIR FORCE.

The London Gazette.

Mar. 20.

ral Duties Branch.—The following Plt. Offs. are promoted to the Flg. Off. with effect from the dates indicated:—J. H. E. (June 18, 1927); J. H. Pool (Oct. 11, 1927); G. H. Godwin 7, 1927); F. L. Lawrence (Nov. 8, 1927); C. H. A. Colman, H. F. , W. E. W. Grieve, S. R. Sherman (Jan. 10); R. C. Edwards, Hennessy, D.S.O., M.C., A. O. Moore (Jan. 14); T. M. Abraham, Buxton, R. J. Carvell, L. S. Hill, J. W. Pease (Jan. 17); E. S. (Jan. 30).

following Plt. Offs. on probation are confirmed in rank:— Moore (July 14, 1927); B. G. Farrow (July 17, 1927); P. F. G. y, G. W. Monk, G. N. S. Lane, S. Hatton, R. C. Hancock, C. Somerhough, J. E. Stuart-Lyon, R. David (Mar. 19).

Off. H. L. Patch is placed on the half-pay list, scale B, Mar. 12 1928, inclusive; Flt. Lt. J. A. Glen, D.S.C., is placed on the list at his own request (Mar. 12); Flg. Off. A. H. C. A. Rawson nsferred to the Reserve, Class A (Mar. 8); Flg. Off. G. W. resigns his S.S. comn. (Mar. 21); C. Campbell, Lt., R.N., Flg. .A.F., relinquishes his temp. comn. on resigning his comn. R.N. (Mar. 7); Flg. Off. W. F. A. Preston (Lt., R.A.—seconded) ishes his temp. comn. on return to Army duty (Mar. 14).

es Branch.—The following Flg. Offs. are granted perm. comns. rank with effect from May 21, 1927, on completion of probaservice:—G. J. Gaynor, F. E. R. Dixon, M.C.

cal Branch.—The following Flt. Lts. are granted perm. comns. rank (Mar. 21):—J. M. Wilder, L. I. Hyder. Temp. Capt. J. M. (Dental Surgeon, General List) is granted a temp. comn. as a on attachment to the R.A.F. (Mar. 1); Flt. Lt. C. T. Hastings Army Dental Corps) relinquishes his temp. comn. on return y duty (Mar. 1).

rve of Air Force Officers.—General Duties Branch.—G. A. is granted a comn. in the Special Reserve as a Plt. Off. on pro- (Mar. 12); Plt. Off. E. L. Purdy, M.C., is promoted to the f Flg. Off. (Mar. 16). The following Plt. Offs. on probation are ed in rank:—J. M. H. Hoare (Mar. 14); B. B. F. Russell 17). The following Flg. Offs. are transferred from Class A s C (Mar. 20):—G. Colledge, W. E. Gandell, M.M. Flg. Off. ell is transferred from Class B to Class C (Feb. 5). The followg. Offs. relinquish their comns. on completion of service:— Vebster (Sept. 16, 1927); M. H. Findlay, D.S.C., D.F.C. (Jan. 13); Paton, D.C.M. (Mar. 11); E. Crewdson, M.C., H. S. Howard, Squire (Mar. 18). The following resign their comns. (Jan. 15):— A. F. Ingram, Flt. Lt. A. E. Reynolds, Flg. Off. B. A. Davy, f. J. T. O'Brien-Saint.

liary Air Force.—General Duties Branch.—No. 602 City of w (Bombing) Squadron.—The following to be Flg. Off.:— Lennox (Mar. 1). No. 603 City of Edinburgh (Bombing) on.— The following Plt. Off. to be Flg. Off.:—L. J. Blake).

ess Mary's R.A.F. Nursing Service.—Staff Nurse Miss Nora is promoted to the rank of Sister (Oct. 20, 1927).

Appointments.

Week ending Mar. 26.

al Duties Branch.—Squadron Leaders C. H. Nicholas, D.S.C., to No. 20 Sqdn., India, 17/3. H. Stewart, to No. 9 Sqdn., n, 15/3. D. G. Donald, D.F.C., A.F.C., to R.A.F. Training Base, rs, 1/3. C. E. W. Foster, to School of T.T. (Men), Manston, . Workman, M.C., to No. 3 F.T.S. (Cadre), Spittlegate, 1/4. t Lieutenants R. A. George, M.C., to remain at H.Q., Cranwell, of to R.A.F. Depot, Uxbridge. J. Duncan, to No. 1 School of T.T. (Apprentices), Halton, 16/3. A. R. M. Richards, A.F.C., to H.Q., Aden Command, 16/3. F. C. Marsh, to No. 2 Wing H.Q., India, 28/2. A. R. Prendergast, to No. 27 Sqdn., India, 21/2. R. K. Emerson, to Station H.Q., Heliopolis, 1/3. J D. S. Denholm, to R.A.F. Practice Camp, Sutton Bridge, 28/3. L. de V. Chisman, to R.A.F. Station, Upper Heyford, 26/3.

Flying Officers E. M. Thompson, to No. 403 Flight, 2/1. D. J. Harrison, to No. 423 Flight, 17/3. A. L. Ottway, to No. 41 Sqdn., Northolt, 12/3. V. C. Taylor, to No. 19 Sqdn., Duxford, 12/3. W. A. Andrews, to No. 23 Sqdn., Kenley, 12/3. L. G. Martin, to School of Naval Co-operation, Lee-on-Solent, 19/3. C. G. C. Sullivan, to Station H.Q. and Storage Section, Andover, 2/4. C. H. G. Brembridge, to No. 2 F.T.S., Digby, 16/3. F. B. G. Walker, to Night Flying Flight, Biggin Hill, 5/3. D. G. K. Walker, to No. 26 Sqdn., Catterick, 13/1.

Pilot Officers A. R. Grenfell, to No. 5 F.T.S., Sealand, 30/3. A. McKee, to Aircraft Depot, India, 11/2. R. Y. Bootes, A. M. Cowell, A. J. P. Groom, A. Haywood, A. D. Jaffe, R. V. Redpath, R. E. S. M. Vinning and A. H. Westwood, to No. 1 F.T.S., Netheravon, 13/3. G. F. Simond, to R.A.F. Depot, Uxbridge, on appointment to a Perm. Comn., 16/3. The undermentioned Pilot Officers are posted to the R.A.F. Depot, Uxbridge, on appointment to S.S. Comns., with effect from 16/3:—J. A. G. Baker, H. M. S. Barnard, M. I. Barnett, J. Beaumont, F. A. R. Bishop, B. S. Bramble, W. E. Catling, R. Chadwick, R. D. Cotton, W. J. Crisham, R. S. Darbyshire, F. P. Donovan, H. J. Forster, F. C. G. Freeman, O. V. Garrett, O. I. Gilson, E. S. Greenwood, A. N. E. Hall, C. P. Hanlon, J. A. Harris, B. W. C. E. Hartwell, E. G. Hitchins, T. R. Hope, H. T. Lines, V. B. Lintott, J. H. Lock, E. D. Mills, R. Mountain, V. H. Nicolay, J. S. Pole, G. E. F. Proctor, J. B. W. Pugh, O. H. Robbins, N. X. Sheldrick, L. H. Snelling, F. H. Taylor, D. Timms, J. G. Watling, R. F. Williams and R. F. A. W. Williams.

Medical Branch.—Squadron Leaders R. J. Aherne, M.C., to H.Q., M.E., 9/3. P. H. Young, M.B., to H.Q., 'Iraq, 9/3.

Flight Lieutenant R. Boog-Watson, M.B., D.P.H., to R.A.F. Station, Upavon, 30/3.

Flying Officers J. Twohill, M.B., to R.A.F. Training Base, Leuchars, 20/3. G. T. O'Brien, to R.A.F. Practice Camp, Sutton Bridge, 29/3. M. Clancy, to R.A.F. Practice Camp, Weston Zoyland, 29/3. G. W. J. Williams, to R.A.F. Practice Camp, North Coates Fitties, 29/3. L. Freeman, G. W. McAleer, M.B., E. P. Carroll, J. F. McGovern, M.B., and W. Heron, M.B., to H.Q., 'Iraq, 9/3.

Stores Branch.—Squadron Leader W. J. King, D.C.M., to No. 1 School of T.T. (Apprentices), Halton, 26/3.

Flying Officer C. W. Rugg, to H.M.S. *Argus*, 20/2.

Accountant Branch.—Flight Lieutenants W. R. Westcombe, to H.Q., Middle East, 17/3. E. V. Humphrey, to Station H.Q., Heliopolis, 1/3.

'Iraq Awards.

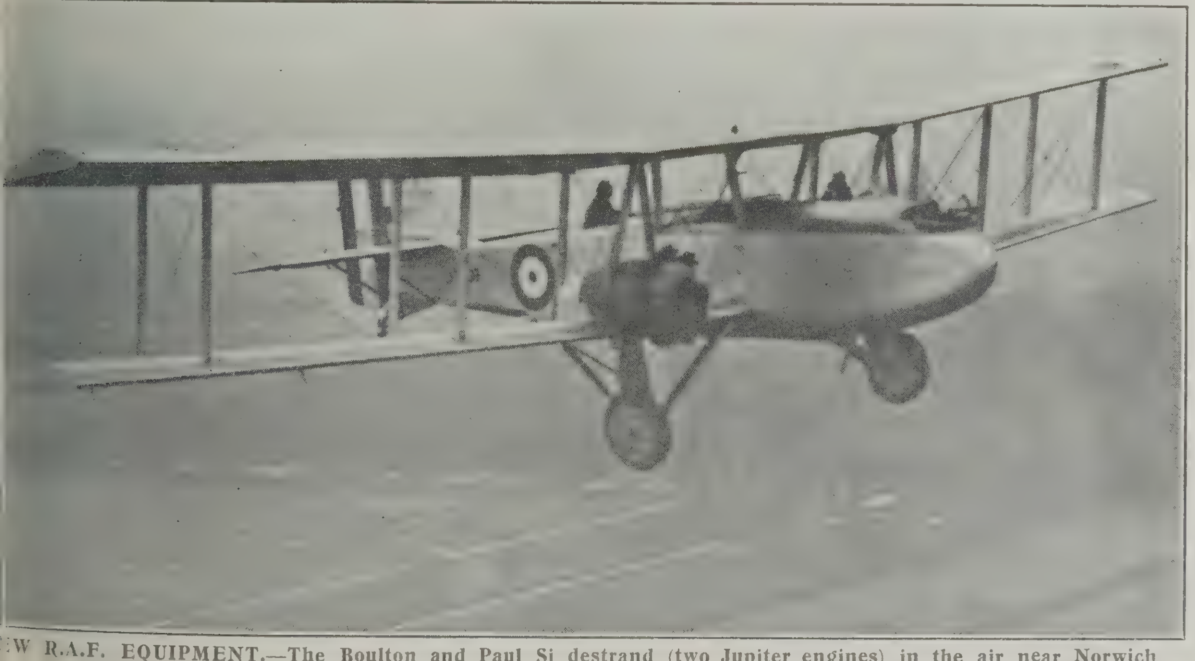
The King has approved of the following awards in recognition of gallant and distinguished service rendered in the operations in the Penjwin area of 'Iraq during the period April-May, 1927:—

D.S.O.—Sq. Ldr. Francis Henry Coleman, R.A.F.

The King has also approved of the following awards in respect of operations in 'Iraq during April and May, 1927:—

M.M., for bravery in the field.—No. 333193 Cpl. George Henry Beauchamp, No. 30 (Bombing) Sqdn., R.A.F.

The names of the following have been brought to notice in a report dated June 16, 1927, from Air Vice-Marshal Sir



W R.A.F. EQUIPMENT.—The Boulton and Paul Sidestrand (two Jupiter engines) in the air near Norwich piloted by Sq. Ldr. Rea, the firm's test pilot. This machine is described fully on page 418.

Edward Leonard Ellington, K.C.B., C.M.G., C.B.E., Air Officer Commanding, British Forces in 'Iraq, for distinguished services rendered in connection with the operations in the Penjwin area of 'Iraq during the period April-May, 1927 :—

ROYAL AIR FORCE.—Flt. Lt. Guy Murton Moore, M.C.; Flt. Lt. Richard Harrison, D.F.C.; 86025 Sjt. (Pilot) Frederick William Newman, 335992 L-AC. Basil Henry Reeves.

[Sq. Ldr. Coleman was in command of No. 30 (Bombing) Squadron at that time stationed at Kirkuk.]

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident at Henlow to an Avro machine of the Home Aircraft Depot, Henlow, on March 22 Flt. Lt. Frank Jezzard, M.B.E., the pilot of the aircraft, died from injuries, and 349643 L-AC. Percy Jack Hooper was slightly injured.

The 1928 Cairo-Cape Town Flight.

The annual Service flight under the command of Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., which left Heliopolis on Mar. 1, arrived at Pretoria on Mar. 21 after a forced landing had been made at Potgietersrust to repair an oil leakage.

The Flight arrived at Bloemfontein on Mar. 23.

The Flight arrived in Cape Town on Mar. 24 and were received by the Mayor and Mayoress of Cape Town, a representative of the Governor-General of Cape Colony, the Officer Commanding the Defence Force and others.

Group Captain C. R. S. Bradley.

Group-Captain C. R. S. Bradley, O.B.E., whose appointment as His Majesty's Air Attaché at Rome was announced in the Court Circular of March 16, was born in 1882 at Lansdown, Bath, Somerset, and educated at Brighton. He joined the Cape Mounted Rifles in 1901 and served in South Africa in 1901 and 1902. He was granted a commission in the Royal Inniskilling Fusiliers in 1902 and transferred to the Indian Army in 1905. He served in India, and in France with the Indian Army until March 1915, when he was seconded to the R.F.C. He learned to fly at Le Crotoy on a Maurice Farman biplane, and his Royal Aero Club certificate No. 1346 is dated June 23, 1915. He was posted to Egypt in August 1915, and restored to the Home Establishment in 1916. He was appointed Flight-Commander in January 1916, and Squadron-Commander in March 1916. He was promoted to Major in the Indian Army in April 1917, and Lieut.-Colonel in April 1918. In August 1919 he resigned his commission in the Indian Army on appointment to a permanent commission in the R.A.F. He was awarded the O.B.E. in the King's Birthday Honours in 1919 for his services during the War. He was appointed to No. 10 Group, Lee-on-Solent, in 1920, and in 1922 he was posted to 'Iraq for Staff Duties at Headquarters. In August 1924 he was restored to the Home Establishment and commanded Station Headquarters at Duxford until he was appointed to command the Home Aircraft Depot at Henlow in July 1925.

Wing Commander A. H. Jackson.

Wing-Commander A. H. Jackson, whose appointment to command the new No. 3 Flying Training School at Spittlegate is dated March 1, was born in India in 1890 and educated at Winchester and Sandhurst. He entered the Notts and Derby Regiment in 1911 and was seconded to the R.F.C. in September 1915. He learned to fly on a Maurice Farman biplane at Birmingham, and his Royal Aero Club certificate, No. 1442, is dated July 15, 1915. In February 1916 he was posted to No. 5 Squadron in France and remained with that Unit until October of that year. He returned to France in November 1917 and served with No. 82 Squadron until April 1918. After the Armistice he was appointed to the School of Technical Training (Apprentices), and in 1923 he satisfactorily passed a course at the R.A.F. Staff College, Andover. In 1924 he was posted to the Air Ministry for duty as Chief of the Air Force Police with the rank of Wing-Commander. In August 1927 he was appointed to Spittlegate for duty as Station Commandant.

Wing Commander E. H. Johnston.

Wing-Commander E. H. Johnston, O.B.E., D.F.C., whose appointment as Air Attaché to the British Legation at Buenos Aires is dated Dec. 24, 1927, was born in 1885 in Cape Town and educated at the Normal College, Cape Town. He joined the 2nd Imperial Light Horse in November 1914 and served with them until June 1915. He was seconded to the R.F.C. in January 1916 and joined No. 5 Squadron in France in May 1916. He was appointed Flight Commander in August 1916, and returned to England at the end of that year. In August 1917 he was posted to No. 20 Squadron in France, and in October 1917 he was promoted to the temporary rank of Major. Except for a short spell of Home duty at Biggin Hill he remained with No. 20 Squadron until February 1918, when he was posted to No. 22 Wing H He was awarded the O.B.E. in January 1919 for his serv during the War. In 1920 he was appointed to command 24 Squadron, and in December 1922 he was posted to 'I to command No. 30 (Bombing) Squadron. He was awar the D.F.C. in December 1924 for distinguished service 'Iraq. In 1924 he was posted to H.Q. India for Air S Duties, and on his return to the Home Establishment 1926 he was appointed to command the Armament and G nery School at Eastchurch.

Headquarters R.A.F. India.

Headquarters of the Royal Air Force, India, will be mo from New Delhi to Simla on April 2.

The Grantham Air Station.

The Air Ministry announces that the R.A.F. Station Spittlegate will be known in future as the Grantham Station.

Spittlegate was, until recently, the aerodrome for No. and No. 100 Squadrons, but is now the Station for the ne formed No. 3 Flying Training School.

R.A.F. Practice Camps.

An Air Ministry Order states that the R.A.F. Prac Camps at Sutton Bridge, North Coates Fitties and West Zoyland will be open from March 29, and that the ran will be open for bombing and firing from April 16.

Permanent Commissions in the R.A.F.

The following officers have been accepted provisionally permanent commissions in the R.A.F., subject to their p ing the prescribed medical examination. It is inten that these officers shall be gazetted to permanent comi sions with effect from June 1, 1928 :—

Flt. Lt. T. B. Bruce, Flg. Offs. P. G. Chichester, E. C. De P. J. A. Hume-Wright, F. R. D. Swain, R. T. Taaffe, M. Wiblin J. H. Woodin.

Extended Commissions in the Reserve.

The service of the undermentioned officers of the R. Reserve has been extended for five years :—

Class A:—Flg. Offs. L. C. Burcher, C. S. Clarke, P. H. Davies, F Dimsdale, W. E. Gandell, L. C. Hillman, C. N. James, R. B T

Class C:—R. F. Cathrow, J. A. Rudd.

The service of the undermentioned officer of the R. Reserve has been extended for two years :—

Class A:—H. D. Morley.

Special Assessments.

Air Ministry Weekly Orders notify that the undern tioned officers and airman have been awarded special ass ments in accordance with paragraph 361 of King's Reg tions, on completion of the *ab initio* course of trainin No. 5 F.T.S., Sealand :—

Special Distinction.—Flg. Off. D. F. W. Atcherley; No. 348437 J. G. Freeman.

Distinguished Pass.—Flg. Offs. P. F. G. Bradley, G. W. Monk, R. G. Forbes.

The W.R.A.F. Dinner.

The Fifth Annual Re-Union Dinner of the Women's R Air Force Old Comrades' Association was held at 24, Vict Street, S.W.1, on Mar. 24. Dame Helen Gwynne-Vaugh D.B.E., President of the Association, was in the Chair. W.R.A.F.'s came from all over England, Scotland and W to attend the re-union.

Marshal of the R.A.F. Sir Hugh Trenchard, who wa have been the Chief Guest, was prevented at the last mon by illness from coming but sent a very kind and frie message to the assembly.

Among the Guests were Air Commodore E. R. Lud Hewitt, Commandant of the R.A.F. Staff College, Douglas Powell, of the Services Benovelent Fund, W Cdr. R. B. Ward, Miss J. M. Cruickshank, Matron-in-C of Princess Mary's R.A.F. Nursing Service, Sq. Ldr. G Marshall, R.A.F.M.S., and representatives of the Si Services.

Proposing the Royal Air Force, Dame Helen Gwynne-Vaughan minded her audience that the R.A.F. to-day was practically the size as the W.R.A.F. was in 1918. She spoke of the early days o Flying Services and said that the individuality of air fighting resulted in the rediscovery of the chivalry of war. She then sa few words about the R.A.F. in the past year and referred to the East Flight to Singapore and the winning of the Schneider Tr and to Mr. Hinkler's great flight to Australia.

Replying to the toast of the Royal Air Force, Air Comm Ludlow-Hewitt said that he was conscious of being a very inade substitute for the Chief who he was sure was extraordinarily appointed in not being able to be there. He then said a little a the work of the R.A.F. during the past ten years and the develop which has taken place. He illustrated the progress by saying the pre-War pilot going for a flight still found himself looking side spotting for a landing ground in case anything went wrong h his engine, but the modern pilot did not care much what he was ng over because he never expected his engine to give out.

roposing the health of the Old Comrades' Association, Air Com- lore Ludlow-Hewitt said that he had no previous idea of the stence of the Association and was astonished to find it such a live ir. He was interested to hear of the organisation connected with or charitable purposes and thought the whole thing proved again comradeship and *esprit-de-corps* of the W.R.A.F. during the War.

eplying for the Old Comrades' Association, Miss N. Campbell, the fatigable Secretary, said that the pessimists had prophesied that O.C.A. would die in a year. Looking round the room she thought vas a pretty healthy corpse. She thought that she voiced the ings of the whole Association in quoting from a letter from a nber in New Zealand, who had written saying, "Serving in the .A.F. was the proudest thing I ever did in my life."

ıe toast of Our President and Commandant was acclaimed with ical honours.—C. M. MCA.

R.A.F. SPORTS AND PASTIMES.

Rugby Football.

he Army versus the Royal Air Force.—The Army beat R.A.F. at Twickenham on March 24 by three goals and ry (18) to two tries (6). It would be almost correct to that the R.A.F. were beaten by Mr. Young, of the val Tank Corps, whose strategy and tactics alone were ponsible for the victory of his side, which, on the run the play, was beaten fore and aft from beginning to end the game.

he Army were handicapped from the start by the loss of smn. Gibbons, a forward, who was injured in marking ball from the kick-off, and was not able to return.

he R.A.F. forwards got the ball in the scrum nine times of ten in the first half, and the fine Army defence was ed to its last ounce. Unfortunately, the Air Force threw y a lot of what they gained by a series of penalties. No n playing against Gdsmn. Rees can afford to give away kicks. Rees has got a left-foot drive which, given isturbed action, recovers ground which has taken ten utes of hard work to win in the first place.

he R.A.F. three-quarters played astonishingly well. ir handling was faultless and they moved at a good e. In fact, the very precision of their attacking move- its defeated their own ends. They never once did any- ıg unexpected, with the result that the Army were ays ready for them.

t scrum-half Sq. Ldr. Russell was at his very best in nce and got some beautiful shots away in attack. ards the end of the game his passes got a bit wild, Flg. Off. Odbert retrieved them in a most miraculous mer.

ig. Off. Hale-Munro had a bad day at full-back. The bounced against him with the most brutal ill-luck, and he dropped the ball with fatal results, and once or e he knocked-on with almost fatal results. Also, he ed one or two kicks, but he atoned to a great extent some very sound play.

Air Force dashed into attack from the kick-off but three penalties against them in the first five minutes sobered them down and Russell cleared with a long kick from a scrum on the Air Force line. The R.A.F. backs settled into steady attack but the Army defence was too clever for them. Chick was doing some useful work in the line out. A flying tackle by Pott laid Palmer out temporarily and he was transferred to the wing. Cole, the Army stand-off half, was doing some good fielding and kicking.

Half an hour from the start Young saw the ball for the first time in the match and cut through but Cole was hemmed in and his safety kick was fielded by Hodder and the game went right down the field and the Army had to touch down. The Air Force got the ball again from the drop out and Bremridge finished off a good movement by crossing the line. He was adjudged however to have stepped into touch on his way down although to the spectators he did not seem within five yards of touch. From a scrum in the same corner O'Malley went across on his back but lost the ball before he could turn over on it. The Air Force were still within inches of scoring when Rees got the ball and his tremendous kick found Hale-Munro too far forward and the game went back to the centre.

Two more Air Force attacks broke down through forward passing on the wing and ten minutes' hard forward work was lost to a penalty. Young and Cole got away for the Army and slid past Hale-Munro but Russell appeared from nowhere and saved the situation.

Early in the second half Young ran through the whole R.A.F. defence, dodged back and passed to Bryan, who touched down. Rees kicked a goal. Odbert made several attempts to use the same tactics against the Army but did not succeed. The Air Force forwards gained about fifteen yards by hard shoving and promptly lost thirty by a kick for offside.

Some loose play from a line-out was followed by a bad mis-field by Hale-Munro and Bryan crossed the line with the ball at his feet. The goal kick failed. Coote's kick at goal from a penalty fell short and was fielded by Browne who battered down three Air Force players before he was shoved into touch. Hodder found touch near the flag from some handling between Russell and Odbert and G. Beamish got over from a scrum on the line. The goal kick fell short.

Young started another Army manœuvre and after some reverse passing between Devitt and Bryan the latter crossed the Air Force line for the third time. Rees kicked the goal.

Shortly after this the Air Force scored their second try, Pott touching down after some short passing near the line. A grim battle between the forwards in the last five minutes ended in Townend getting across. Rees kicked another goal.—C. M. MCA.

The teams were:—*Army.*—Gdsmn. T. E. Rees; Lieuts Sir T. G. Devitt, A. R. Aslett, G. V. Palmer and G. J. Bryan; 2nd Lt. J. R. Cole and Lieut. A. T. Young; Sjt. D. Jones, L/Cpl. W. A. Morton, L/Cpl. G. Townend, Lieut. C. K. T. Faithfull, Lieut. G. E. R. Bastin, Lieut. W. F. Browne, Lieut. H. H. C. Withers and Gdsmn. P. E. Gibbons.

R.A.F.—Flg. Off. T. A. Hale-Munro; AA. P. B. Coote, Plt. Off. J. R. H. Pott, Flg. Off. F. S. Hodder and Flg. Off. C. G. H. Bremridge; Flg. Off. R. V. M. Odbert and Sq. Ldr. Russell; Flt. Lt. C. J. S. O'Malley, F-S. G. F. Cockell, Flg. Off. F. V. Beamish, Plt. Off. H. A. Constantine, Flt. Lt. C. D. Adams, Flt. Lt. J. S. Chick, Flg. Off. G. R. Beamish and Cpl. M. G. Christie.

Cross-Country Running.

The R.A.F. Cross-Country Championship was held at Henlow on March 21.

The Senior Team Championship was won by Uxbridge.

The Individual Championship was won by AC. F. W. Turner (Uxbridge). The runner-up was AC. R. H. Thomas (Henlow).

R.A.F. FOOTWORK.—Flg. Off. F. V. Beamish with the ball at his feet in the Army v. R.A.F. Rugger match at Twickenham on Mar. 24. Lt. A. T. Young of the Tanks is about to take the ball away from him and between them is Flt. Lt. Chick under the watchful eye of the Referee. On the left is Flg. Off. G. R. Beamish and in the centre of the picture is Flt. Lt. O'Malley.

MOTH NOTES.

Mr. W. L. Hope, while flying a Moth to Italy for delivery to Count France Mazzoti, a well-known Italian racing car-driver, was forced to land on Mar. 18 in Switzerland on a snow-covered plateau at about 8,000 ft. altitude. The cause was no defect in either Moth or its engine, but merely a sudden descent of thick cloud and the approach of darkness.

Mr. Hope and Count Mazzoti, who accompanied him, were rescued by a party of Alpine Fascisti, and the next morning were able to move the Moth to a plateau large enough to take off. A set of special skis were concocted with boxes to take the Moth wheels, and on these the machine, carrying Mr. Hope alone, reached flying speed and was able to take off. The skis—left behind when the machine rose—shot over the edge of the plateau into a ravine.

Mr. Hope arrived at Turin without further incident, and was joined there by his luggage and passenger.

Firm orders for 29 (twenty-nine) Moths were placed with the De Havilland Aircraft Co. Ltd., during the first full week in the month of March.

On Mar. 21 Lord Ossulston took delivery at Stag Lane of a new X type Moth. His previous Moth—which he had sold to the Newcastle-upon-Tyne Aero Club—has given him 250 hours of flying over England, Belgium and Holland, with no trouble other than one punctured tyre.

On Mar. 22, Commander Macdonald, R.N. (retd.), passed his test for an "A" licence at the De Havilland School, and thereafter took possession of a new X type Moth built to his order. This machine is a single-seater with long-range fuel tanks.

Apropos Capt. de Havilland's convincing demonstration of the safety of the Moth when properly fitted with Handley Page automatic slots and an adequate undercarriage, which was described in THE AEROPLANE of Mar. 21, it is now believed that the slight undulations noticed in the final stalled descent were caused by a change in the C.G. and the machine's consequent trim, owing to the removal from the rear locker of a quantity of tools and other oddments which had been in the locker during all previous test flights.

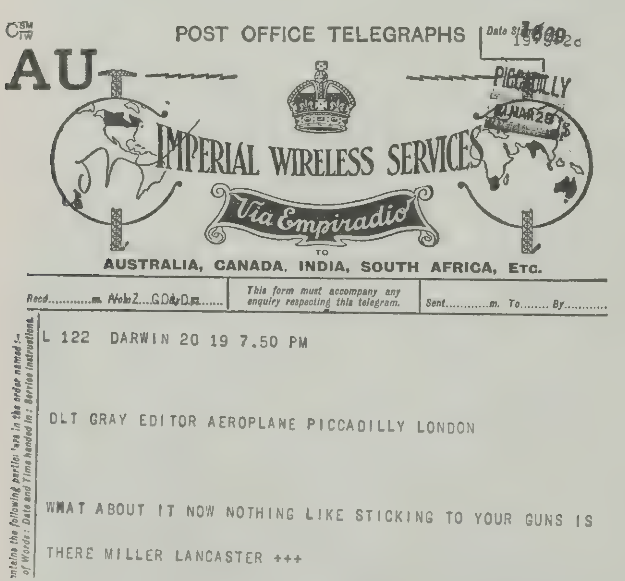
Another Moth with slots and the new undercarriage is now practically ready and will be flying during this week. Extensive tests will be made with this machine, and even a greater degree of safety will it is hoped be achieved as a result.

THE "RED ROSE" FLIGHT.

On Mar. 26 Mr. Bruce, the Australian Prime Minister, sent a message on behalf of the Commonwealth congratulating Mr. W. N. Lancaster and Mrs. Keith Miller on their flight from England to Australia in their Avro Avian, the "Red Rose," and expressing gratitude that in spite of the difficulties and delays the journey had at last been safely accomplished.

Their journey occupied 32 flying days from London, averaging seven hours daily, at 70 miles an hour.

On Mar. 26 the "Red Rose" flew to Toowoomba and Brisbane.



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WHAT ABOUT IT NOW NOTHING LIKE STICKING TO YOUR GUNS IS

THERE MILLER LANCASTER +++

JUSTIFIABLE PRIDE.—How Mrs. Miller and Mr. Lancaster announced to "The Aeroplane" their arrival at Port Darwin, after one of the pluckiest flights in the history of flying.

LADY BAILEY'S PROGRESS.

Lady Bailey, who reached Cairo on Mar. 19 on her attem to fly to Cape Town, was informed by the British Residen on Mar. 22 that the Governor-General of the Sudan woul not permit her to continue her progress across Sudanese ter tory unescorted, on account of the danger of a forced lan ing during the present rainy season, when it might pro impossible for any rescue party to discover or reach her.

Flt. Lt. R. R. Bentley, who is now on his way northwar bound for England, has been asked by the Johannesbu *Star,* and has agreed, to retrace his journey from Khartu southwards and to act as Lady Bailey's escort.

Thus escorted, she will be permitted to continue h journey, and on Mar. 27 she is proceeding to Khartum await Flt. Lt. Bentley's arrival.

A REGRETTABLE ACCIDENT.

On Mar. 25, Miss Winifred Brown of the Lancashire Ae Club was involved in a regretttable accident at Dukinfiel Cheshire, with her own Avro Avian.

She had arranged to deliver a cinema film by air to theatre in Stalybridge. After some difficulty in discoverin the chosen landing field, she made five attempts to lan Finally she touched the ground but realising that she cou not pull up before hitting the boundary wall opened up he engine in an attempt to get off again.

In doing so she hit one small boy on the head killing hi instantly, injured five other spectators, and then struck th wall.

Her machine was badly damaged but Miss Brown and he passenger escaped with slight injuries.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Mar. 25.

Flying Time 34 hr. 15 min. *Instruction* 23 hr. 35 min. *Soloists* 10 h 40 min. *Instruction.—With Mr. F. G. M. Sparks*—Miss D. Fletche Miss H. Cholmondeley, Miss M. Wilson, Mrs. P. Fraser, Major R. M. Veal, Messrs. G. Black, H. W. Marlow, L. Rowson, A. G. G. Marsha J. P. Edinger, W. H. Lane, H. Sutton. *With Mr. F. R. Matthews* Miss M. Wilson, Miss D. Fletcher, Miss H. Cholmondeley, Mr Guest, Messrs A. G. G. Marshall, A. O. Wigzell, A. L. Pett D. Schreiber, J. A. Crane, W. H. Lane, R. Ward, C. Peckham, Clarkson, H. W. Marlow, S. O. Bradshaw, J. A. Murphy, J. C. Watso H. Sutton, E. R. Andrews. *Soloists.*—Miss D. Fletcher, Miss W. Spooner, Major Beaumont, Major R. M. S. Veal, Messrs. R. Sande Clark, G. C. Bonner, H. M. Samuelson, P. W. Hoare, B. B. Tuck J. H. Saffery, O. J. Tapper, G. H. Craig, G. W. Hall, E. E. Stamme W. Hay, E. E. Fresson, C. E. Murrell, A. R. Ogston, W. L. O'Connor, A. F. Wallace, J. J. Hofer. Seven passengers were giv joy-rides.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Mar. 24.

Flying Time 23 hr. 5 min. *Instruction* 8 hr. 10 min. *Soloists* 7 h 45 min. *Passenger Flights* 6 hr. 15 min. *Tests* 55 min. *Instructi With Mr. Baker*—Messrs. Benson, Tweedale, Hartley, Sykes, Harriso Weale, Miss Hill, Messrs. Eills, Mills, Riley, Goss, Gort, Garn Chart, Slack, Mason, Cohen, Heath, Watson, Pattreioux. *With M Cantrill*—Miss Baerlein. *Soloists (Under Instruction).*—Miss Baerlei Messrs. Cohen, Hall, Brooking, Ruddy, Benson, Gort. *Pilots.*—Messr Meads, Cantrill, Harber, Twemlow, Browning, Lacayo, Leemin Crosthwaite, Nelson, Hardy, Davison, Wade, Heath, Goodfello Scholes, Williams, Dobson. Fifteen passengers were given joy-ride

In spite of bad weather 44 members took the air. Mr. Benson ma an excellent first solo, Mr. Gort did his height test, and Miss Baerle made her maiden solo since her accident in September last.

We offer our deepest sympathies to Miss Brown over her accident Sunday at Dukinfield.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Mar. 25.

Flying Time 20 hr. 30 min. *Instruction* 5 hr. 15 min. *Soloists* 1 h 45 min. *"A" Pilots* 12 hr. 15 min. *Tests* 1 hr. 10 min. *Joy-rid* 5 min. *Instruction.—With Mr. Parkinson*—Messrs. Floyd-Brow Runciman, Horn, White, Percy, E. J. Griffiths, Brooks, Cochrane-Car Dr. Alderson. *Soloists.*—Messrs. Floyd-Brown, W. L. Runciman, Perc De Pledge, N. Horn. *"A" Pilots.*—Mrs. Heslop, Messrs. C. Thompso R. N. Thompson, F. L. Turnbull, H. Ellis, J. Stawart, R. M. Stobi F. H. Phillips, P. Forsyth Heppell, Lord Ossulston, Dr. H. B. Dixon, Miss C. R. Leathart, Messrs. D. Wilson, A. Bell. Six passenge were given joy-rides.

Mr. Floyd-Brown and Mr. W. L. Runciman made their first sol in excellent style during the week.

Lord Ossulston brought his new "X" Moth from Stag Lane Thursday, going on to Chillingham later. He returned to fly in th Landing Competition on Sunday.

The Landing Competition for the Pearce-Thorn Trophy on Sund was very successful. Mr. F. Howard Phillips was the winner, M A. Bell second and Mr. Forsyth Heppell third.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, York-

Report for week ending Mar. 24.

Flying Time 13 hr. 15 min. *Instruction* 8 hr. 40 min. *Soloists* 55 min. *Passengers* 40 min. *Instruction.—With Mr. Beck*—Me Ambler, Brown, Cooke, Crowther, A., Crowther, H., Dane, Humphe Ostler, Dick. *With Mr. Stockbridge*—Mr. Ostler. *Soloists.*—Mess Brown, Humpheries, Dick. *"A" Pilots.*—Messrs. I. Thomson Wood. Four passengers were given joy-rides.

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Flying took place on three days only this week, namely Sunday, Friday and Saturday. This was due to heavy winds, rain and mist.

A new member, Mr. Stewart Dick, joined this week.

SV is over at Brough for further modifications, in the meantime The Blackburn Aeroplane Co. have lent us TA so that we are working with two serviceable machines.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending Mar. 24.

Flying Time 12 hr. 20 min. *Number of members given Dual Instruction—by Flt. Lt. Rose*, 9. *Soloists*, 9. *Total number of members taken on Club machines*, 9.

High winds restricted flying during the week.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Mar. 25.

Flying Time 20 hr. 40 min. *Soloists* 8 hr. 25 min. *Dual* 10 hr. 35 min. *Passenger Flights* 1 hr. *Tests* 40 min. *Instruction.—With Flt. Lt. Swoffer*, 11. *Passengers—With Flt. Lt. Swoffer*, 3. *Soloists*, 11. *Passengers.—With Mr. Kirby*, 1.

Mr. Shepherd successfully made the tests for his "A" Licence. We have a number of new flying pupils, but the weather has seriously affected our flying activities.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending Mar. 18.

Flying Time 13 hr. *Instruction.—With Mr. F. Fry*—Messrs. Marshall, A. J. K. Finch, G. Barker, E. Lambert. *Soloists.*—Messrs. N. Brett, H. Mack, R. F. Potter, H. Pank, R. T. Harmer, W. P. Cubitt, G. Surtees, F. Gough. *Number of Passengers*, twelve.

A Special Meeting of the Directors was held at the Royal Hotel, Norwich, on Mar. 14, to consider a report presented by Mr. C. R. Bignold and Capt. Russell Harmer. These two members, with Mr. F. Gough (Temp. Hon. Manager), investigated the whole position of the Club, past, present, and future, and made a report which was accepted. Mr. F. Gough was appointed Hon. Managing Director for twelve months, and a special Managing Committee consisting of Messrs. H. Cator, W. A. Ramsay, R. Harmer, W. P. Cubitt and F. Gough was appointed. All other Committees were disbanded.

Mr. G. McEwen, who has recently been in charge of the Aerodrome Office, was appointed Club Secretary. Apart from the Manager we now have a completely paid staff.

Report for week ending Mar. 24.

Flying Time 8 hr. 25 min. *Instruction.—With Mr. Fry*—Messrs. G Barker, E. Bougrat, E. Lambert, C. Browne, E. Varden Smith, A. J. K. Finch. *Soloists.*—Messrs. G. F. Surtees, H. Mack, R. F. Potter, W. P. Cubitt, F. Gough, W. A. Ramsay. *Number of Passengers*, three.

Mr. G. Barker, of Lowestoft, went solo on Saturday. After a spell of bad weather we put in some good flying on Sunday.

The aerodrome will be closed down on Mondays in future in order to give the staff a rest.

The Suffolk Aeroplane Club.

[Hon. Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Mar. 25.

Flying Time 12 hr. 5 min. *Instruction.—With Mr. Lowdell*—Miss D. Creasy, Miss S. Edwards, Miss G. Rhodes, Dr. Dunn, Messrs. Schofield, Billinton, Peck, Hanson, Verney. *Soloists.*—Miss Sylvia Edwards, Dr. Sleigh, Messrs. K. Peck, R. Brown, S. Schofield, C. Prentice. *Passengers*, ten.

The telephone is now installed at the aerodrome—Hadleigh 57.

On Wednesday our Instructor, with Mr. Verney as passenger, flew to Croydon in Bluebird G-EBRE for the inspection by the King of Afghanistan.

The "On To Hadleigh" Rally.—We have received a large number of entries for this rally, also quite a number of people who are not yet sure of their plans have asked for an extension of the closing date of this. Pilots can now enter as late as Apr. 7 providing we receive a telegram stating point of departure, make of machine and registration number.

Special Note.—All pilots flying from Lympne and East Kent are to fly to Hadleigh *via* Sutton Farm Aerodrome, Nr. Hornchurch, Essex. They are to fly over Sutton Farm Aerodrome at a height of not more than 100 feet so that the Official Observer can note registration marks. This course has been adopted to avoid crossing the mouth of the Thames. The finishing line at Hadleigh is a track across the aerodrome running North and South; machines arriving are to cross this from West to East.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Mar. 24.

Flying Time 27 hr. 20 min. *Instruction* 13 hr. 15 min. *Soloists* 9 hr. 20 min. *Passenger Flights* 4 hr. 45 min. *Instruction.—With Mr. Bartlett*—Messrs. Tanner, Garnett, Hall, Roberts, B. L. Bathurst, Kennan, Hughes, Girdlestone. *Instruction.—With Mr. Tratman*—Mr. Hall. *Soloists.*—Messrs. Arnold and T. H. Clarke. *Cross-Country Flights.*—Mr. Bartlett and Mr. Tanner to Stag Lane and Croydon, Mr. Downes-Shaw to Maidenhead and Cardiff. *Passengers*, eleven.

Only one of the three machines we sent off to Croydon managed to get there on Mar. 21. Mr. Downes-Shaw and Messrs. Tratman and Hall being stopped by thick weather and turned back at Badminton. Mr. Bartlett with Mr. Tanner went up to Stag Lane on Monday and were present at the review. On Thursday last we had a visit from Capt. J. W. C. Martyn, aged 93, who had a trip with Mr. Bartlett and was delighted to see while passing over Avonmouth Dock a ship which he had once commanded.

We are praying for fine weather and a large attendance at the Pageant here on May 5.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending Mar. 19.

Flying Time 19 hr. 30 min. *Dual* 10 hr. *Soloists* 3 hr. 30 min. *Passengers* 6 hr.

This has been a very quiet week and very few pupils have put in an appearance, in spite of good weather. Mr. R. S. Moore, the Assistant Secretary of the Club, went to Edinburgh to represent the Gnat Aero Company at the inaugural meeting of the newly-formed Edinburgh Aero Club.

On Mar. 26 we were busily engaged on an "Aerial Bear Hunt." Early in the morning a bear escaped from a private Zoo near Brighton so first thing we telephoned the police and offered to co-operate with them in their search for the missing animal by flying over the Downs In spite of flying nearly two hours we unfortunately failed to locate the bear. We shall possibly have another try to-morrow. I believe I am right in saying that we are the first Aero Club to provide members with this new game of "spot the bear."

Report for week ending Mar. 26.

Flying Time 20 hr. 10 min. *Dual* 7 hr. *Soloists* 3 hr. 10 min. *Passengers* 10 hr.

On Wednesday Mr. Miles took the Vice-President and Secretary of the Tonbridge Wells Club to Croydon for the visit of the King of Afghanistan; the flight was made on the Club Avro VI.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending Mar. 25.

Flying Time 108 hr. 50 min. *Instruction.—Dual*, 42 hr. 30 min; *Soloists*, 55 hr. 10 min. *Other Flying.*—11 hr. 10 min.

Slightly improved weather conditions and longer evenings have led to a considerable increase of the work of the school during the past week.

Three first solos were made, the pupils including Mr. F. St. Barbe, who on Saturday did his second first solo, after a standard course of instruction, albeit spread over a long period. His first effort was some 5 or 6 years ago, and was the result of a somewhat intensive course of lessons associated with a wager.

Two pupils also satisfactorily passed their "A" licence tests.

Six new Moths and the repaired Hound were also tested during the week.

During the week a number of Cambridge undergraduates also reported for "ab initio" training in the Royal Air Force Reserve.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending Mar. 22.

Flying Time 17 hr. 35 min. *Soloists* 3 hr. 25 min. *Dual* 14 hr. 10 min. *Dual.—With Mr. H. D. Davis*—Messrs. Jonassen, Davies, Whitley, Whithard, Hapsburg, McCabe, Worley, H'Siao, Mills and Dr. Wall. *Soloists.*—Messrs. Habsburg, McCabe, Whitley, Liniker, Crabtree, and Dr. Wall. *Dual.—With Mr. A. E. Golds*—Van Gessel and Dr. Forcythe.

Although the flying time was low owing to bad weather, we have been able to launch Mr. Habsburg and Mr. Whitley "Solo."

Dr. Wall was sent up for his height test on the 22nd and after he had left the ground his Instructor was informed by one of the pupils that Dr. Wall was out to break the School height record. He continued flying well after sun had set and landed in semi-darkness. At the time we were worried about him breaking the rules and regulations, but as the flight was made very satisfactorily no further comments were made. Dr. Wall has now passed his Air Test for his R.Ae.C. Certificate. Messrs. Davies and H'Siao are new pupils.

BOOKS ON AERIAL NAVIGATION

PRINCIPLES AND PRACTICE OF AIR NAVIGATION.
Lieut. J. E. Dumbleton. 12s. 6d.

PRIMER OF AIR NAVIGATION.
H. E. Wimperis, M.A. 8s. 6d.

MANUAL OF AIR PILOTAGE. 2s.

INTERNATIONAL GENERAL AERONAUTICAL MAP—"BRITAIN." 4s.

AIRCRAFT INSTRUMENTS.
H. N. Eaton. £1 5s

GENERAL INSTRUMENT EQUIPMENT FOR AIRCRAFT, 1927. 3s. 6d.

AERONAUTICAL METEOROLOGY.
W. R. Gregg. 12s. 6d.

THE AIR PILOT, GREAT BRITAIN. £1 12s. 6d.

Orders to the value of £5 or over will be sent post free in the United Kingdom. The cost of postage must be added to all net prices in these lists for orders under £5.

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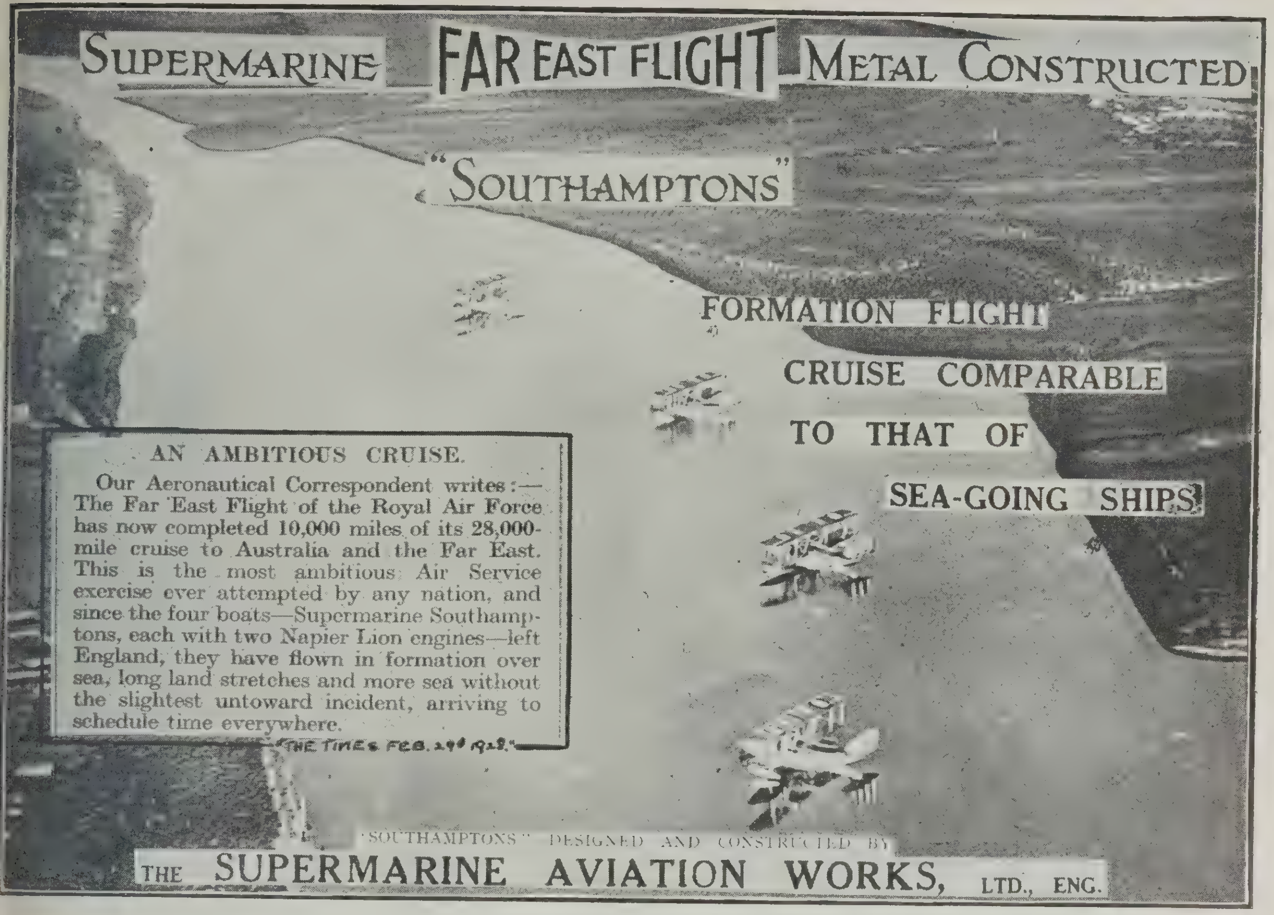

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Our Aeronautical Correspondent writes:—The Far East Flight of the Royal Air Force has now completed 10,000 miles of its 28,000-mile cruise to Australia and the Far East. This is the most ambitious Air Service exercise ever attempted by any nation, and since the four boats—Supermarine Southamptons, each with two Napier Lion engines—left England, they have flown in formation over sea, long land stretches and more sea without the slightest untoward incident, arriving to schedule time everywhere.

"THE TIMES FEB. 29th 1928."

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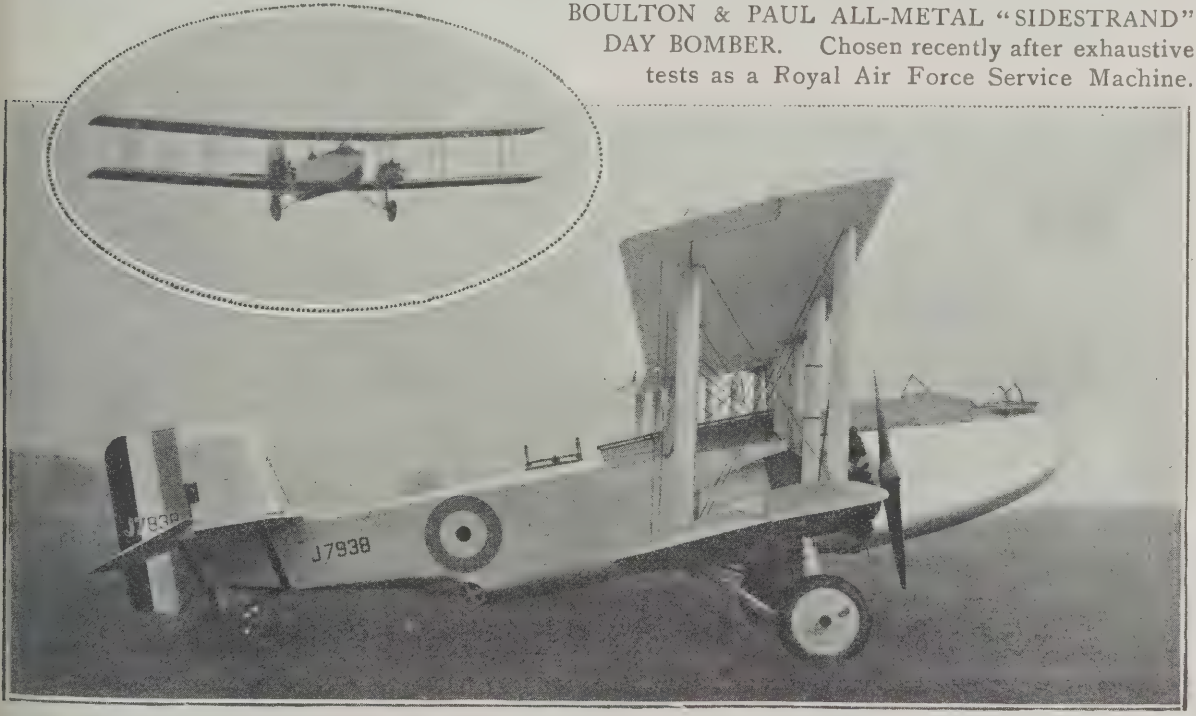

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 5; Monday, 20; Tuesday, 18; Wednesday, 18; Thursday, 18; Friday, 18; Saturday, 18.

IMPERIAL AIRWAYS LTD.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 47, passengers 308, freight 14 tons.
AIR UNION:
Paris—London: Machines 28, passengers 79, freight 14½ tons.
K.L.M.:
Amsterdam—Rotterdam—London: Machines 14, passengers 80, freight 4½ tons.
SABENA:
Brussels—London: Machines 12, passengers 3, freight 1½ tons.
DEUTSCHE LUFTHANSA AG.:
Amsterdam—London: Machines 11, passengers 30.
PRIVATE:
Machines 3, passengers 1.

Total number of trips by British Machines, 50, carrying 309 passengers. Foreign Machines, 65, carrying 187 passengers.

COMPARATIVE FIGURES.

Week ending Mar. 24:
Machines, 115; Passengers, 496; Crews, 225; Total personnel, 721.
Corresponding week, 1927:
Machines, 78; Passengers, 302; Crews, 130; Total personnel, 432.
Corresponding week, 1926:
Machines, 78; Passengers, 285; Crews, 100; Total personnel, 385.
Corresponding week, 1925:
Machines, 89; Passengers 259; Crews, 105; Total personnel, 364.
Corresponding week, 1924:
Machines, 58; Passengers, 134; Crews, 100; Total personnel, 234.
Corresponding week, 1923:
Machines, 85; Passengers, 371; Crews, 156; Total personel, 527.
Corresponding week, 1922:
Machines, 66; Passengers, 177; crews, 105; Total personnel, 282.
Corresponding week, 1921:
Machines, 48; Passengers, 162; Crews, 60, Total personnel, 222.

Croydon Notes.

The event of the week was naturally the visit of the King of Afghanistan, which was remarkably well stage-managed. In the ordinary way the visitor to Croydon will see far more foreign than British machines, but for this occasion the balance was redressed by the production of large numbers of club and private light aeroplanes and by the discreet behaviour of such foreign machines as were about.

For this occasion the public enclosure, which is a rough tract of grass enclosed by a steel fence lying between the new hotel and the works of A.D.C. Aircraft Ltd., was opened. It was occupied by some fifty people and about three motor-cars. Purley Way however was largely obstructed by the cars of onlookers.

It is very little use providing a bare and unattractive space of this kind when the roadway itself provides an equally good view, and at least dry foothold.

The pilot of one of the light aeroplanes which came to Croydon for this occasion received rather a nasty shock. He decided not to return home on Wednesday but to stop the night in London, leaving his machine at Croydon.

A member of the aerodrome staff told off to put his machine into a shed, and presumably accustomed only to handling heavy commercial machines, lifted it so vigorously by the tail skid that he stood the machine on its nose, and dented the spinner severely.

The pilot then discovered that he had no remedy. Machines are handled by the aerodrome staff at the owner's risk only, and he has to bear any consequences arising from their misdoings.

The new Junkers G.31 which arrived at Croydon on Thursday afternoon and returned on Friday morning was greatly admired by all who saw it. For a machine with three Jupiter VI engines the accommodation provided for twelve passengers seems small, but the extreme comfort and spaciousness of the cabin, and the air of solidity about all the fittings, produced a very favourable impression.

In considering this machine it is well to remember that sleeping berths for twelve passengers can be provided, and that the fuel capacity (for approximately 750 miles) shows that the machine is intended for long-distance work.

Actually with this large amount of fuel the total disposable load capacity of the machine is well over 3,000 lbs., and with fuel for 300 miles or so, twenty passengers could easily carried.

It is also well to remember that the G.31 has a top sp of 125 m.p.h., and cruises at well over the 100 m.p.h., wh is considerably more than the speed of any British c machine of equal capacity.

KING AMANULLAH AT CROYDON.

The visit of the King of Afghanistan to the Lon Terminal Aerodrome at Croydon on the morning of Wedn day, Mar. 21, was the occasion for a very interesting play of civil aircraft, more particularly of the light a plane class.

His Majesty reached the aerodrome at 10.30 hrs. and received by Sir Samuel Hoare (Secretary of State for A and Air Vice-Marshal Sir Sefton Brancker (Director of C Aviation), and was at once conducted over the new ministrative buildings. During this inspection he was sho the new control tower—which incidentally is not yet actu in use—and was enabled to "listen in" to wireless c munications with the Imperial Airways machines wh left Paris at 08.00 hrs. and arrived at Croydon shortly a 10.30 hours.

Thence he proceeded to the "tarmac" where he spected thirty or so specimens of light aeroplanes, includ Club and privately-owned Moths, Avians and Bluebirds, gether with the new Parnall Imp, the Hawker Cygnet, new Blackburn Blue Bird with the Cirrus engine, and—i class by itself—the Handley Page Harrow complete slots.

While the Royal Visitor was inspecting these machi Mr. Neville Stack, who had previously taken the air i Nimbus-engined D.H.9 belonging to A.D.C. Aircraft L dropped a mail container on a parachute—from what at looked like a very dangerous position—onto the aerodr about 20 yards behind the lined-up aeroplanes.

A postman in uniform promptly salved the container, handed the contents to the Director of Civil Aviation, wh turn delivered to the King a stamped and post-marked ture post-card of the Aerodrome bearing in Persian scri message of greeting from the Air Council.

Thereafter His Majesty, together with his staff, Sir San Hoare, Sir Sefton Brancker, and sundry others emba on an Imperial Airways Argosy, and was taken for a f of about 25 minutes' duration over London. Judging from demeanour on alighting from the machine, King Amanu enjoyed this trip immensely, and after alighting he gratulated his pilot—Mr. Rogers—on his handling of machine.

Mr. Neville Stack then demonstrated the handiness of modern light aeroplane by removing, single-handed, Avro Avian from a special portable hangar erected on edge of the "tarmac," unfolding its wings, starting engine, and taking the air.

A demonstration of the aerodrome "flood lighting" jector for night landing concluded the serious part of business, and thereafter the company officially assem partook of light refreshments in one of the rooms of the ministrative buildings, and His Majesty departed at a 12.30 hrs.

King Amanullah appeared to be specially interested in presence of two lady pilots—Miss Spooner of the Lo Club and Miss Brown of the Lancashire Club. He was greatly interested in the well-known photographic ma Central London, produced by the Aircraft Operating Co. which is so prominent on the Underground Railway sta platforms. At His Majesty's special request a copy of map, with the route of his own flight over London marke will be supplied to him by the Aircraft Operating Co

MADRID—LONDON IN 10 HOURS.

On Mar. 20 a Fokker F.VII (450 h.p. Jupiter engine) w had been chartered by Mr. Van Lear Black, the Ame millionaire, flew from Madrid to London, a distance of miles, in 10 flying hours.

It left Madrid at 06.00 hrs, and flew to Paris non- arriving there at 14.00 hrs. After refuelling it left I at 14.20 hrs. and arrived at Croydon at 16.20 hrs.

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SIR ALAN COBHAM'S RHODESIAN TOUR.

ir Alan Cobham has made a rapid aerial tour of Rhodesia a D.H. Moth in order to investigate the uses of the ntry as a part of the proposed Cairo—Cape air service. left Johannesburg on Mar. 18 and spent the day at awayo. He arrived at Salisbury on Mar. 19 and in the ernoon met the Premier of Southern Rhodesia. He left Bulawayo and Livingstone on Mar. 20, where he met Governor of Northern Rhodesia, and reached Johannes-g again on the following day.

le has thus done in five days, with ample time for inter-vs, a trip which normally takes ten days of train travel h no time for interviews.

A GERMAN ATLANTIC ATTEMPT.

)n March 26 Capt. Hermann Köhl, manager of the Night-ing Department of the Deutsche Lufthansa, Baron von hnefeld, and a mechanic, left the Tempelhoferfeld, Ber- at 08.20 hrs. on the first stage of a flight across the antic. They arrived at Baldonnel Aerodrome, near Dub- at 16.30 hrs. They are flying a single-engined Junkers noplane.

If the weather is favourable they intend leaving Baldonnel at dawn on March 28. Capt. Köhl will act as pilot, and Baron von Hühnefeld, who is financing the venture, will navigate the machine.

Both the Deutsche Lufthansa and the Junkers company disclaim any active interest in the flight.

THE GOTHENBURG FLYING MEETING.

The Svenska Flygklubben of Gothenburg, Sweden, is organising an International Flying Meeting to be held at the Torslanda aerodrome from May 17 to 20 inclusive. This meeting is open to all civil aircraft and to all flying clubs.

The opening event will be the "Star-Competition" which is a species of "On to Gothenburg" race. Competitors in this event should reach the aerodrome between 13.00 and 14.00 hrs. on May 20.

A complete series of flying demonstrations has been arranged, and all taking part in the meeting may count on being received with characteristic Swedish hospitality.

Full information as to the meeting can be obtained from Svenska Flygklubben, Postbox 192, Gothenburg, Sweden.

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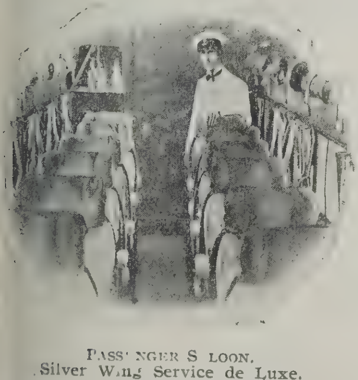

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THE BRITISH AIR LINE TO THE CONTINENT.

THE ANNUAL REPORT OF HANDLEY PAGE LTD.

The Ordinary General Meeting of Handley Page Ltd. was held on Mar. 21 at Winchester House, Old Broad Street, E.C.

Mr. S. R. Worley (the Chairman of the Company) said that after placing £15,000 to reserve and writing off £3,239 for depreciation, a credit balance of £31,638 remained. The directors thought the result of the year's trading satisfactory, and they recommended the payment of a final dividend of 5% on the Preference shares, making a total of 10% for the year, and the carrying forward of the remaining balance (£11,723) to next year's accounts

Referring to the slotted wing, Mr. Worley said that the directors considered the patents in this invention valuable, not only financially, but as a method of protection against the perils of stalling. They were at present negotiating for the adoption of this invention with a number of foreign Governments, and they expected ultimately to receive sums on this account which would more than justify the value placed on the slot patents in their balance sheet.

Mr. F. Handley Page, in seconding the adoption of the report, explained that when an aeroplane, not fitted with slots, lost flying speed it either spun or dived into the ground, usually with fatal results. Properly fitted with slots this type of accident could be completely avoided. Accidents of this type could be avoided even on the ordinary type of aeroplane by the skill of the pilot, but it was much better to insure against the possibility by fitting slots, and never needing them, than to risk a fatal accident which might result from one small error of judgment.

The slotted wing was being adopted throughout the Royal Air Force. A large number of R.A.F. machines had already been fitted and contracts for a still larger number had been placed.

In this country the Government had the right to use any patent device without referring to the patentee and the question of compensation had to be determined by reference to the Royal Commission on Awards to Inventors. Their invention was being used to a very large extent, and it was impossible to forecast the nature of the award which they would receive from this tribunal. This state of affairs did not extend to civil aircraft, in regard to which they retained full rights.

In regard to the majority of their negotiations with foreign Governments it was not yet possible to publish details of the arrangements made. Licences had already been granted in France, the United States, and Germany, and negotiations were proceeding in respect of Japan, Italy, Belgium, Sweden and Spain.

In the case of the United States, they had already received a payment of $125,000 (say £25,000) which had been taken into account in previous years. Royalties were to be paid as a percentage of the value of the aircraft fitted with slotted wings, and when the total royalties due amounted to $875,000 (say £175,000) the U.S. Government was entitled to free use of the patents. Civil rights in the United States were not covered by this agreement. Mr. Handley Page then issued the following warning :—

> I would issue a word of warning to those who take a very optimistic view at the moment as to the value of our patent rights. In nearly all cases we have to deal with Governments with many diverse interests to be considered, and Governments are notoriously slow in reaching decisions. The ultimate sums which we receive will depend very largely on the use that will be made of the device, and this use may be stated only to be just commencing.
>
> New devices may be brought out which will replace the present method of design. We may have to face cases of infringement and possibly heavy expenses in fighting such actions. I would not have you think now that the great value of our patents has been demonstrated that there will be immediate realisation of large sums for these patents. With this note of warning I would turn to another phase of our company's activities, that of our manufacturing operations.

During the previous year, Mr. Handley Page continued, they had continued to receive their share of Air Ministry contracts and they expected to continue to do so in the future. As time went on and types became standardised competition became more and more stringent and prices tended to fall. It was only by strenuous economy that a manufacturing profit had been achieved. At present, depending largely on Government orders placed only on a yearly basis, it was very difficult to organise for cheap production and falling prices. It would be much more satisfactory for all concerned if the national programme of aircraft construction could be organised on at least a three-years' basis.

At last year's meeting he had referred to their interest in Civil Aviation and had expressed regrets at the absence of co-operation between manufacturing and operating interests.

Their subsidiary company, Handley Page Transport Ltd., was one of the two pioneers of Civil Air Transport in this country. Without its support British Civil Aviation would not have carried on during the unsubsidised period of 1919-1920 When in 1923-24 they had decided to merge into monopoly undertaking which had since carried on Bri Civil Air Transport it was on the understanding that tl interests in Civil Aviation should be maintained and tl representation in the company continued. That co-opera however had not been allowed them, and he felt, in their interests as well as in those of aviation as a whole, that was a matter for regret.

The report was unanimously approved and the retir director (Mr. S. R. Worley) was re-elected.

THE ANNUAL REPORT OF VICKERS LTD.

It is announced in the annual report of Vickers Ltd. 1927 that arrangements are being made to float the Vick aircraft works at Weybridge as a separate subsidiary c pany, to be known as "Vickers Aviation Ltd." Vick Ltd. will thus become purely a holding company in the craft business.

The report shows that the firm made a gross profit du the year of £1,275,995, as against £846,072 in the prev year. After deducting debenture interest and writing £110,011 for depreciation, there is a net profit of £992,98

Of this £238,211 is placed to reserve, £262,730 is tributed as a dividend of 8% on the ordinary shares £208,722 is carried forward. The total reserve funds of firm now amount to £500,000.

AIR SURVEY PUBLICATIONS.

A reader of THE AEROPLANE is anxious to have copie certain publications which have been issued within re years on various subjects pertaining to air survey. If reader of THE AEROPLANE can supply any of these pub tions, all of which appear to be out of print, he or sh asked to communicate at once with the advertiser. The of books will be found in the page of small advertisem at the end of this paper.

PERSONAL NOTICES.

DEATHS.

HUNTER.—On Mar. 12, at Aylesbury, the result of an acci Maureen Joan Tuite (Boodles), the dearly loved only child of Flg. and Mrs. H. J. Hunter, aged 2½ years.

JEZZARD.—On Mar. 22, at Henlow, as the result of a flying dent, Flt. Lt. Frank Jezzard, M.B.E., R.A.F.

Flt. Lt. Jezzard served with the R.A.F. during the War and the Armistice was posted to H.Q., Middle East Command. On return to England he underwent a course at the Electrical and less School at Flowerdown and in November, 1921, was posted t Instrument Design Establishment at Biggin Hill. In 1922 he to the Marine Aircraft Experimental Establishment, Isle of G and in 1923 he was appointed to the R.A.F. Unit in H.M.S. *Argus* 1925 he was posted to H.Q., Coastal Area, for Staff Duties (Sig and in March, 1927, he was posted to Henlow. He was promoted Flight Lieutenant in July, 1927. He was a qualified Signals Offi

FORTHCOMING MARRIAGE.

PEARSON—POTTER.—A marriage has been arranged between Maclaren Pearson, late Cameronians and R.F.C., second son of th C. J. B. Pearson and Mrs. Pearson, and Bettine Marie Ham elder daughter of Major Cyril and Mrs. Potter, Blakes, Lymin Hants.

BIRTHS.

KNOWLES-BROWN.—On Mar. 23, at Hampstead, to Ma Kathleen (*née* Cordingley), wife of A. W. Knowles-Brown (late R. —a daughter.

SMITH.—On Mar. 19, at 15, Curzon Park, Chester, to Hope, of Sq. Ldr. V. R. Smith, R.A.F.M.S.—a daughter.

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TEN YEARS OF THE R.A.F.

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 14. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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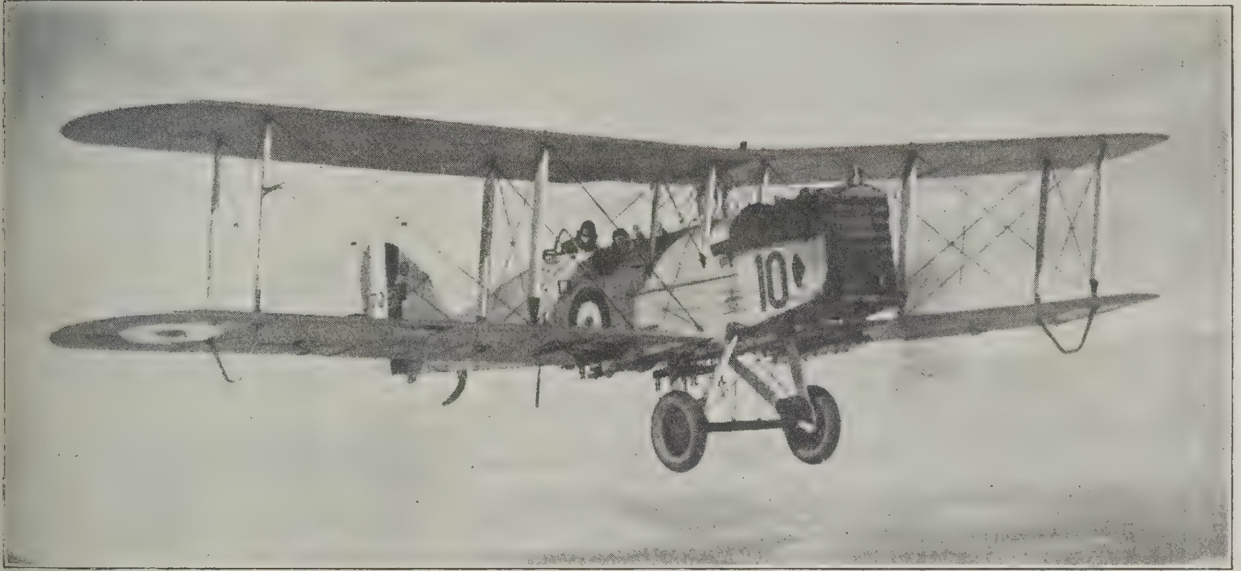
25
OF ILLINOIS

"PER ARDUA AD ASTRA."
(*The Motto of the Royal Air Force.*)



TEN YEARS AFTER:—A D.H.9a (400 h.p. Liberty engine) of 39 (Bombing) Squadron. This type of machine, which is now being gradually replaced by modern equipment, was in use in the R.A.F. ten years ago. It was used in particular for long-distance bombing raids by the Independent Force, R.A.F.

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ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew across the **SOUTH ATLANTIC** *in* 1922.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew **round AUSTRALIA** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Fokker monoplane flew from **HOLLAND** *to the* **EAST INDIES** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Handley-Page aeroplane flew from **BRUSSELS** *to the* **BELGIAN CONGO** *in* 1925.

ROLLS-ROYCE AERO ENGINES in Dornier-Wal flying boats flew from **MOROCCO** *to* **SPANISH WEST AFRICA** *in* 1926.

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APR. 4, 1928.

THE AEROPLANE

VOL. XXXIV. No. 14.

Incorporating
Aeronautical Engineering

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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BIRTHDAY GREETINGS TO THE ROYAL AIR FORCE.

From Baron Weir of Eastwood, Secretary of tate for the Royal Air Force, 1918-19.

I ask the Royal Air Force to accept the warmest and ost cordial congratulations on its tenth birthday from second Secretary of State. The only thing which ould have justified the creation of the Royal Air Force a critical stage of the War was success. This was hieved, and its war record more than equalled the orious records of the Royal Flying Corps and the oyal Naval Air Service.

To-day I see a post-war organisation of an entirely w British Fighting Service, and I regard it as inmparably the most efficient Air Force in existence, editable alike to British organisation and British aracter. It is a welcome portent to the Empire that s new Fighting Service affords opportunity not only the old British qualities of courage, determination, d enterprise, but also to the spirit of true scientific ogress.

Weir

From Major General Seely, Under Secretary r Air and President of the Air Council, 1919.

It is impossible to exaggerate the importance of the ying Arm to the Forces of the Empire, and I need rdly say how cordially I wish well to our gallant ing service airmen, who maintain the prestige of itain in all parts of the Empire.

John Bernard Seely

From Sq.-Ldr. F. E. Guest, Secretary of State Air 1921-22.

n the ten years of its existence the Force has ated traditions at a speed commensurate with that its own machines, and has made itself fully worthy rank with the older services.

hese three sister services are spinning the destiny our country, just as the three Fates of classical thology spun the destiny of mankind. Some of us ik that it is the Air Force which is destined to give ngth of texture to the whole fabric. We see in the gnificent work of the Air Force upon the outskirts our Empire the birth of a swifter, cheaper, and er means of bearing our responsibilities. We see the organised flights of service machines to Singae and the Cape the forging of a stronger and more mate bond between the scattered portions of our pire. It is obvious that the Air Force must receive public support which so great an instrument of ential imperial benefit and imperial defence deserves.

I ask your readers therefore to keep before themselves two main objectives:—

(1) To see that the officers and men of the Air Force get a square deal both during and after their service:

(2) To develop the essential backing to the first line of the Air Force, namely, the Auxiliary Air Force and Civil Aviation.

Complacency at the results already achieved would be fatal. They are a good beginning, but only a beginning. Remember we have still the fewest civil machines, we carry the fewest passengers, and we fly the smallest mileage of any first-class Power.

This birthday then must be an occasion not merely for congratulation, but for resolve never to rest until Britain takes to the Air as once she took to the sea.

Frederick Guest

From Baron Gorell, Under Secretary of State for Air, 1921-22.

Ten years is not long in the history of great institutions: contrasted with the Navy and the Army the Royal Air Force is a child indeed—as far as age is concerned; but in only one other respect—that is it has preeminently the vitality, the imagination, and the potentialities of childhood. Even in its short past it has a record of daring, courage and endeavour hard to equal, impossible to surpass—and it has almost all the future.

What has struck me most about it as a branch of the armed forces of the Crown is the rapidity with which it has created for itself that most elusive and valuable of all things, namely tradition. Tradition is normally the growth of many years: the Royal Air Force in its young life has already a tradition second to none. To praise its heroisms, to prophesy its achievements, is to dwell upon the obvious.

Less obvious, more intangible and yet commanding all possible respect is the spirit of the Royal Air Force which in ten years has come to be its tradition. It has youth, it has charm, it has strength. It has added to the deathless stories of our race and it has enhanced the estimate throughout the World of the British character.

Gorell

From The Duke of Sutherland, Under Secretary of State for Air, 1922-24.

The new young Air Force is ten years old to-day. The precocious infant is just growing its wisdom teeth, and it might be said to have attained prematurely the knowledge of a grown man. How many of the new generation who never knew the great War are pouring their strength, their vitality, and their youth into the veins to this great new power. What keenness and expectancy radiates from them as they embark on their novel and fascinating profession—requiring as it does, essentially the nerves and skill of youth to carry out!

May they grow and prosper, rising above professional jealousies of one arm for another, and working always for peace by their readiness for war—the front line of defence of the British Empire of to-morrow.

Sutherland.

From Baron Thomson of Cardington, Secretary of State for Air, 1924.

During the first ten years of its existence the Royal Air Force has established a great tradition and gained the confidence and gratitude of the nation. May its future be as glorious as its past, and may it go on as it has begun.

Thomson.

From Mr. Leach, Under-Secretary of State for Air, 1924:

Great Britain's Air Force consists of some thirty thousand picked young men, probably the nation's most perfect physical specimens. At a sign from some elderly statesmen they are ready to die in the service of their country. The knowledge of this fact makes it incumbent on His Majesty's Government to pursue at all times a policy of international goodwill and friendliness to other peoples. Unhappily it is Governments who fail, never the Air Force.

William Leach

From Sir Samuel Hoare, Secretary of Sta for Air 1922-24 and 1924-28.

The youngest of the fighting services has, in t short decade of its existence, built up a distincti tradition of which it may well be proud, and you w have an inspiring tale of achievement to unfold in yo special issue which will, I am sure, be great appreciated by all ranks of the Force.

Samuel Hoare

From Sir Philip Sassoon, Under Secretary State for Air, 1924-28.

The best tribute to the success of the Royal Air For is the difficulty which most people, I think, experien in realising that the Service is only just ten years ol In that short space of time it has taken an assur place beside the immensely older services of the Na and Army. It has created for itself traditions and *esprit de corps* comparable with theirs and is recognis as a younger sister, no doubt, but quite definitely sister Service.

There is to-day nowhere, or nowhere that rea matters, any looking back to the days when the arm was represented merely by subsidiary branches the Navy and the Army; no serious reconsideration the important decision taken only ten years ago. Th this should be so, is evidence not merely of the wisdo of the decision then taken, but also of the foresigh zeal and general efficiency with which all ranks of t Royal Air Force have performed their various a responsible duties.

Short as a decade may be in the lifetime of one of t King's Services, it is a substantial period in the li time of those who have laboured with the Royal Force from its birth and by their ability and enthusia have raised it to its present proud position. They a all members of the Service are heartily to be congra lated upon the splendid results of their devoted effor

Philip Sassoo

AS IT WAS IN THE BEGINNING.—A Squadron of the R.A.F. in France in 1918. The officers of No. 24 Squadron at Bisseghem. No. 24 Squadron was part of the Xth Brigade in 1918 and was commanded by Major V. A. H. Robeson, M.C., who is seated in the middle of the group.

ON THE TENTH BIRTHDAY OF THE R.A.F.

When the Royal Air Force came into being on April 1 918, the state of affairs in France looked just about as bad s our worst enemies could have wished. The Great Ger- ıan Push, which began on March 21, had reached an end hich seemed to be highly satisfactory to the enemy. Most f our political mis-leaders at home were convinced that we ad lost the War. The masses of the people of this country ere as grimly determined as ever to win it, but were ıortally afraid lest our feeble politicians should let us down y agreeing to a humiliating peace. And the public mind as in no way set at rest by our expensive Propaganda epartment, which was run by newspaper friends of the politi- ans and was apparently much more concerned to white- ash our political mistakes than to inspire confidence in ır troops in the field and in their leader, Sir Douglas Haig.

Only the Staff at General Head Quarters in France, and a w other people with a real knowledge of war, knew that their easy success in the push the Germans had definitely st the War. Having offended against the first principles warfare by attacking weakness instead of strength, the ermans had exhausted their troops and used up their serves in over-running devastated country. They had me to the limit of their own endurance and possibility of pplies and had only penetrated here and there a few iles beyond the old fighting line of 1916. If they had rown their whole weight against the strongest part of our e further North they might have driven a wedge clean rough to the sea. Thus they would have cut off our uthern armies from the Channel ports, and might quite nceivably have forced an armistice—considering the attide of our politicians at the time.

Probably before such an armistice had expired there would ve been something like a political revolution in England, d a statesman might have arisen who would have been a ıl leader of the nation, and the War would then still have ded in victory for us.

As it was, the German Army defeated itself, the British my was reinforced by the reserves which the politicians d held in England for their own purposes, and the French my managed to hang on without breaking until was reinforced by the newly-arrived American troops.

The Flying Services in the Push.

Apart from the undefeatable spirit of the British Army in ınce, the one bright spot on the West Front was the fact ıt our Flying Services still held the mastery of the air.

By the time of the push for Cambrai, in November, 1917, R.F.C. had the upper hand over the enemy, thanks to stol Fighters and De Havillands 4s, with Rolls-Royce lcon and Eagle engines, and to Sopwith Camels and .5as, all of which came into action in quantities in that year. From that time to the end of the War our superiority in the air could never be doubted, in spite of regrettable incidents on the ground.

In the first days of the German push the Royal Flying Corps and the land squadrons of the Royal Naval Air Service attached thereto had been hampered by the weather. The attack was made in a low fog, in which it was practically impossible for aircraft to work.

Our people did fly, but ordinary reconnaissance was impossible. The flying mostly consisted of what in those days was called ground-strafing, such as machine-gunning enemy columns on the roads and bombing bridges.

One squadron was detailed to bomb a certain point on a main road, and the only way by which the pilots could find their objective was by flying a few feet above the road itself, each machine starting a minute or two after the next ahead. One pilot returning for more bombs said that he had met over twenty machines bearing his own squadron markings—knowing that at the time they had only about a dozen machines in the squadron. The weather was so thick that if a pilot missed the road for a moment he had to circle round to find it again, with the result that the same machines met one another two or three times over.

Another squadron held onto its aerodrome until the very last moment. The German infantry reached the far side of the aerodrome, and when the bullets began to come through the sheds the squadron commander gave orders to quit. The men and the ground officers got away with motor lorries and other motor transport, a few pilots took the risk of flying westward through the fog in the hopes of finding clear air, the rest of the machines were burnt in the sheds, and the pilots got away with the remaining mechanical transport. The hard luck of it was that the far side of the aerodrome marked the limit of the German advance, and the enemy never came any further.

Naturally this weather also prevented the German aircraft from working. But on those parts of the line where the weather was clear, and whenever it was clear over the pushed area, our aviators distinctly had the upper hand.

Thus, when the R.A.F. was born its fighting spirit was as high as it has ever been, before or since. But regard for historical accuracy forces the admission that the new combination Air Force as such was not popular, least of all among the officers and men of the Royal Naval Air Service and the Royal Flying Corps, who were to be amalgamated.

Regardless of the fact that the official financial year begins on the first of April, and so was the only possible date for the creation of the new Service, would-be humorists seized with glee on the date for ill-timed jests. The Air Force itself was held up as a *poisson d'Avril*. The initials themselves were said to stand for Royal April Fools. The

THE CHIEF OF THE ROYAL AIR FORCE.—His Majesty the King inspecting officers of the II Brigade, R.A.F., at St. Omer, on Aug. 6, 1918. In the foreground is General Sir Herbert Plumer, G.O.C. 2nd Army, B.E.F. (now Lord Plumer of Messines) and immediately behind the King is Brig.-Gen. T. I. Webb-Bowen, commanding the II Brigade, R.A.F. (now Air Vice-Marshal Webb-Bowen, A.O.C., R.A.F., Middle East).

mixing of aviators of the Navy and Army was used as the groundwork for jests of the Horse-Marine type. In fact, altogether the creation of the Royal Air Force was as thoroughly unpopular as any new thing generally is among the English.

The Genesis of the R.A.F.

The reasons for the creation of the R.A.F. are worth recalling briefly, for the benefit especially of those thousands of officers and men of the R.A.F. who were small children at school at the date of the Armistice, and whose most vivid memories of the War are of rather dark-coloured bread, which was much better worth eating than anything we get in these days, and of a shortage of butter and sugar.

One has never been quite certain whether the coming into being of the R.A.F. should primarily be ascribed to Mr. Winston Churchill, Mr. Anthony Fokker or Mr. Pemberton Billing. Each, at any rate, was one of the prime causes of the political state of affairs which produced the R.A.F.

In the beginning of Service Aviation the Royal Flying Corps was formed in 1912 with a Naval Wing and a Military Wing. The Naval Wing was controlled by the Air Department of the Admiralty under Captain Murray Sueter, R.N., now M.P. The Military Wing was controlled by the Department of Military Aviation at the War Office under Brigadier-General David Henderson, previously Director of Military Training. The two Wings conjointly had a Central Flying School at Upavon.

Standardisation versus Progress.

The Military Wing, with that regard for efficiency which is typical of the Army, started out with a policy of standardisation and endeavoured from its earliest days to produce with the aid of the Royal Aircraft Factory at Farnborough a type of aeroplane which was to be standardised all over, like a gun or a rifle.

The idea was excellent in itself, but it was about thirty, or perhaps fifty, years too early. Even to-day, sixteen years later, we are still so far from the ultimate development of aircraft that we cannot attempt to standardise types of war machines. The best we can do is to insist that each type shall be standardised unto itself.

Unfortunately, the Military Wing never thought of the very simple expedient of standardising aircraft material and component parts, and letting each individual manufacturer produce the best aeroplane possible with those parts. Incidentally, we have not quite reached that simple kind of standardisation to-day.

The result of this scheme for standardised machines and engines, if it had succeeded, would have been that the Royal Aircraft Factory at Farnborough would have built all the Army's aircraft. Or at best a few favoured manufacturers would have built those aircraft to order. There would have been an end to competition and so there would have been an end to progress.

The Naval Wing, on the other hand, with true Naval regard for effectiveness, but regardless of expense and neglectful of efficiency, refused to have anything to do with the Royal Aircraft Factory at Farnborough and set about encouraging every aircraft manufacturer to produce the best aeroplanes he could, subject only to their material being of the best and their method of construction being passed as safe to fly by the technical officers of the Air Depa ment. In this policy Captain Sueter was backed wh heartedly by Mr. Winston Churchill,—then first Lord of Admiralty.

The result was that the machines designed by the spised Trade had much better performances than th designed by the Royal Aircraft Factory. And, thanks the engineering ability of two Keyham-trained officers R. Engineer-Lieutenants Randall and Featherstone Briggs, t were safer to fly.

Consequently, on the outbreak of war, the Royal Fly Corps was in the process of equipping itself with notorious B.E.s, whereas the Royal Naval Air Serv which had come into existence officially on July 1, onl month before, had a whole menagerie of aircraft of differ types, and had a collective experience which made immediate progress.

The Fokker Scourge.

At the end of a year of war, in the Autumn of 1915, R.F.C., equipped with B.E.s, and an assortment of F mans and Moranes which it had acquired from the Fren was having a very bad time. Mr. Fokker, at that ti working in Germany, had produced the Fokker monopla very like a Morane but with a better performance and eas to fly. This machine, without actually getting the comma of the air, enabled German aviators of the quality of Imm mann and Bölcke to shoot down B.E.s and our ot slow-going aircraft, wherever they found them.

By the end of 1915 the Fokker Scourge, as it was call had reached such a point that the R.F.C., though carry on its job with grim perseverance, was distinctly the un dog.

In the meantime, the Senior Officers of the Navy hav made up their minds that they had no use for aircraft, Air Department at the Admiralty had been carrying or private land war of its own at Dunkirk, and had produ several machines of marked military value—notably 1½-strut Sopwith. The land squadrons of the R.N.A.S. tried the B.E. and scrapped it as useless. It was a be tiful touring machine, but no use for war.

The 1916 Air Enquiry.

Stories of the injured moral of the R.F.C. began to about at home and German air raids were beginning to c vince people in England that there was a war on. And by the beginning of 1916 an active air agitation started.

An officer of the R.N.A.S., one Noel Pemberton Billi who had organised the successful raid on the Zeppe sheds at Friedrichshafen in November, 1914, was allov to resign from the Service, with the rank of Squadr Commander, R.N., and put up for Parliament. After unsuccessful attempt at Mile End, having been suppor by Lord Northcliffe and Mr. Horatio Bottomley and papers which they controlled, he was elected for E Hertfordshire.

Thereupon he began a hectic political agitation in wh he was aided by Lord Montagu of Beaulieu, Mr. Joyn Hicks and others, including The Aeroplane. The res was the formation of a Royal Commission which held w was known as The Air Enquiry, in the Spring of 1916.

Mr. Pemberton Billing's intention was to force an engu

SHANGHAI.—The officers of No. 2 (Army Co-operation) Squadron photographed at Shanghai while the Squadron was part of the Shanghai Defence Force in 1927. No. 2 Squadron, R.A.F., is the direct descendant of No. 2 Squadron, R.F.C., which was formed at Farnborough in 1912 and flew to France on Aug. 13, 1914. The Squadron is now commanded by Sq. Ldr. William Sowrey, D.F.C., A.F.C., and equipped with Bristol Fighters (Rolls-Royce Falcon engines).

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into the misuse of the Air Service by the Navy, as well as into the effect of the Fokker Scourge on the R.F.C. But the Admiralty, with that political astuteness which has always marked the Silent Service, managed to shelve the whole enquiry onto the R.F.C .

As might have been expected, in view of the wildness with which accusations of maladministration had been made, the Commission whitewashed the Department of Military Aviation, and ignored the charges made against it, which amounted in fact to murder by neglect. But the agitators got what they wanted also.

Although the Navy still refused to take aircraft seriously, the Air Department at the Admiralty did at any rate put right various comparatively minor evils which existed in the R.N.A.S. And an Air Board was formed to go into the whole question of the supply of aircraft equipment to both Services.

THE AIR BOARDS.

The idea of this first Air Board was to stop cut-throat competition between the Services in buying material. Before this the Technical Officers at home of either Service used to do their best to corner any material or product which they wanted for their particular job, regardless of its effect on the other Service. Some form of co-ordination was badly needed to overcome this evil, and the first Air Board made a praiseworthy effort to be efficient.

From it in 1917 grew a much mightier Air Board with Lord Cowdray as President. This organisation was charged with the control of aircraft material for both the Services. It took over the Hotel Cecil and filled it with officers who were put into uniform and given military rank, though most of them had never even been to see the war and a high percentage prayed that they might never have to cross the Channel.

The result, at any rate at first, was confusion worse confounded. So far from hurrying the output of aircraft, all the new forms and regulations and the hordes of officers or officials merely hindered the work in the aircraft factories. Consequently the grim humorists of the time nick-named the place the Hotel Bolo, in memory of Bolo Pasha, who had recently been shot as a spy in France—the inference being that the officials at the Hotel Bolo were either actively hindering our efforts to win the War or were merely disinterested spectators.

SIR WILLIAM WEIR.

In the midst of all this trouble there arose one man to whom more than to anybody else the material success of the Royal Air Force may be justly attributed. On July 21, 1917, Mr. Winston Churchill was appointed Minister of Munitions. In that chaotic establishment he discovered a Clydeside engineer, one William Weir, the head of the firm of J. and G. Weir, long famous as makers of pumping machinery, chiefly for marine work. Under him, Sir William Weir was placed in charge of the production of aircra material, and ultimately went to the Air Board.

At the Hotel Bolo Sir William Weir soon decided that produce anything like efficiency in the production of aircra somebody would have to stop the War for several montl while he reorganised things. Reorganisation being obvious impossible, he boldly made up his mind that the only po sible thing to do was to push the whole mass of cha along in front of him and get things moving someho And that is what he did.

Like so many big men in history, Sir William is a sma man physically. But his mental ability and his capacity f work were boundless. He never seemed to fuss or worr And one never heard of his quarrelling with anybody. B as soon as he went to the Hotel Bolo there were mar changes in the staff, and things really began to move. H methods were quiet but very effective, and when "Wil Weir" wanted a thing done it happened.

THE THIRD SERVICE IDEA.

Right away from the time of the Air Enquiry of 19 there had been an agitation for the formation of a sing Air Service in which the R.N.A.S. and the R.F.C. wou be amalgamated. By the Autumn of 1917 this agitation ha grown into a serious demand for the creation of a Thi Service.

The chief argument in favour of combining the Flyi Services, then as now, was that an Air Service command and administered by aviators would have a free hand carry on air war as such, whereas so long as it was und the control of sailors or soldiers it would be used merely an auxiliary or ancillary Service to the Navy or the Arm and so air warfare would never have a chance of developin

Personally, one was at first strongly opposed to the id of a Third Service. One regarded an aeroplane simply as vehicle which should carry a sailor or a soldier on his lawf occasions.

One quite recognised that aircraft were being lamentab misused and disused by the Navy. Certainly nobody de more faithfully with the effect on the Naval Air Service Admirals who were solid ivory from the jaws up, barri one small hole from ear to ear, and of Naval officers wh having been washed ashore from the Fleet, were given co mands in the R.N.A.S. which should have been filled men who could fly.

Also one was fairly critical of the mismanagement of t equipment of the R.F.C. by the War Office and its technic experts at Farnborough. But one had, at any rate, implic faith in those active-minded soldiers who commanded t R.F.C. in the Field in all the different war areas, and those who were charged with the high responsibility training pilots at home.

Terrible things happened in the subordinate comman for obviously there were not enough professional soldiers the R.F.C. to command the smaller formations. Some ve

A CAMPING GROUND.—No. 4 (Army Co-operation) Squadron, R.A.F., in camp in the Oxfordshire Manœuvre Area in 1927. No. 4 Squadron is stationed at Farnborough and is commanded by Sq. Ldr. J. C. Slessor, M.C. It is equipped with Bristol Fighters (Rolls-Royce Falcon engines).

ON THE MARK.—Vickers Virginias (two Napier Lion engines) of No. 7 (Bombing) Squadron on the aerodrome at Worthy Down, near Winchester.

unior regular officers still commanded squadrons at the end f 1917, but even Wings and Depots were commanded by ivilians. So naturally the standard of discipline and ıanners, let alone administration and staff work, were mply horrible when judged by the standard of the Old rmy.

But the senior officers, with all their sound Army training ehind them, were highly efficient as officers and thoroughly live to the possibilities of air war. Therefore, so far as the .F.C. was concerned—and the R.F.C. mattered very much ıore than did the R.N.A.S., thanks to the Navy's refusal) use seaplanes properly—there was no need to worry bout air war being properly waged by the R.F.C.

Truly there was the objection that an Army Commander r Corps Commander could order the R.F.C. under his com- ıand to make some attack solely for his own satisfaction hen the aircraft might have been better used in operations gainst enemy territory far behind the battle area, whereas ı Independent Air Force would only be subject to the rders of its own High Command. Nevertheless, if such air perations were needed they would be ordered by the Com- ıander-in-Chief of all the Armies, and aircraft for the pur- ose would be taken from the various Army Commands or om a separate Flying Corps Reserve immediately under e orders of the C.-in-C.

To-day, under similar conditions, the Air Officer Com- ıanding R.A.F. in the Field would not make an air attack ithout consulting with the C-in-C. Armies, so the staff work either case would amount to much the same thing.

The Air Ministry.

However, whatever the arguments for and against a sepa- te Air Service, the Cabinet decided to create a Third Ser- ce and to give it an Air Ministry of its own. Consequently, ı Tuesday, October 16, 1917, Mr. Bonar Law, the Leader the House of Commons, announced in the House that the Government had decided to create an Air Ministry with the usual accessories.

On Thursday, November 8, 1917, the Air Force Bill was introduced to Parliament and duly passed both Houses practically without opposition.

Naturally, everybody thought that Lord Cowdray, the President of the Air Board, would be the first Air Minister. But to everybody's surprise Lord Rothermere was appointed instead.

Lord Rothermere is a younger brother of Lord Northcliffe, then owner of the *Daily Mail* and other mass-production newspapers. And in the early work of the brothers, Lord Rothermere was the Director of Finance while his brother planned the journalistic campaigns.

They always worked together, but there came a time when, in the scathing words of the *Morning Post,* Lord Northcliffe started the *Daily Mail* for people who could not think and Lord Rothermere started the *Daily Mirror* for people who could not read. And thereafter Lord Rothermere, who as a business man did not obtrude his personality into his picture paper, was less known by the public than was Lord Northcliffe, who never failed to impose his opinions on his readers. Consequently there was considerable surprise when a person so little in the public eye as Lord Rothermere was appointed our first Air Minister.

The story of his appointment is that Mr. Lloyd George, the Prime Minister, offered the post of Air Minister to Lord Northcliffe, who, having decided to quarrel with Mr. George, refused the appointment point blank in a letter to the Press. This letter was as near a slap in the face as it could be, reflecting as it did on the muddled and incompetent methods of the Government. The result of this disclosure was that Lord Cowdray, who thus heard for the first time of the offer to Lord Northcliffe, promptly resigned his position as President of the Air Board in a quiet and dignified letter which would have rubbed salt into the

AT SUNSET.—A Vickers Virginia (two Napier Lion engines) belonging to No. 7 (Bombing) Squadron which is stationed at Worthy Down, near Winchester. No. 7 Squadron is commanded by Wing Cdr. C. F. A. Portal, D.S.O., M.C. *(R.A.F. Official Photograph.)*

wound caused by Lord Northcliffe's letter, for anybody less thick-skinned than the Prime Minister.

Thus, though the late Lord Cowdray was not in fact our first Air Minister, he was, at any rate, the man who was responsible for all the groundwork and the organisation of the Air Ministry. And the R.A.F. to-day, no less than the many great engineering works for which he was responsible, stands as a monument to his memory.

Thereafter, Lord Rothermere duly assumed office as Secretary of State for The Royal Air Force. And fortunately the control of supplies remained in the competent hands of Sir William Weir.

Lord Rothermere has proved himself to be an excellent business man, and his commercial success in the ten years since the War proves that his unfortunate experience at the Air Ministry did not affect his post-bellum cerebellum. But pushful newspaper methods do not work in the administration of a Fighting Service, especially in time of war.

THE FIRST AIR COUNCIL.

The first Air Council consisted of :—

The Lord Rothermere	Secretary of State and President of the Council.
Major-Gen. Sir H. Trenchard, K.C.B., D.S.O.	Chief of the Air Staff.
Rear-Admiral Mark Kerr, C.B., R.N.	Deputy Chief of the Air Staff.
Commodore Godfrey Paine, C.B., M.V.O., R.N.	Master-General of Personnel.
Major-Gen. W. S. Brancker	Comptroller-General of Equipment.
Sir William Weir	Director-General of Aircraft Production in the Ministry of Munitions.
Sir John Hunter, K.B.E.	Administrator of Works and Buildings.
Major J. L. Baird, C.M.G., D.S.O., M.P.	Parliamentary Under-Secretary of State.
Lieut.-Gen. Sir David Henderson, K.C.B., D.S.O.	Additional Member of Council and Vice-President
Mr. W. A. Robinson, C.B.	Secretary to the Council.
Mr. H. W. McAnally	Assistant Secretary.

Here also should be placed on record a statement by Sir Douglas Haig, Commander-in-Chief of the British Armies in France, who, in his despatch at the end of 1917 said :—

> I feel it my duty to point out once more that the position which has been won by the skill, courage and devotion of our pilots can only be maintained by a liberal supply of the most efficient machines.

This dictum should be taken to heart by all who may be at any time in the future charged with the supply of aircraft to the R.A.F. Too often it has been forgotten by technical experts concerned only with justifying their own theories when they should have thought first and foremost of the needs of pilots on Active Service.

Fortunately at this present moment we have nothing to fear from the Technical Department. To-day it is in more able hands than ever before. But the saying of one of Britain's greatest Generals applies for all time.

For the next three months of 1918 the Air Council w concerned with the necessary administrative, financial a disciplinary arrangements for the Royal Air Force. In t meantime the R.N.A.S. and R.F.C. continued to make w as had been their custom for the previous three years.

HATCHING THE R.A.F.

Part of the preparations for the coming into being of t Air Force consisted in designing uniforms for the personn and every humorist in the Service let himself loose on t subject, some of the most humorous efforts, in fact, bei quite unintentionally produced by people who were serious charged with the task of designing the uniforms.

As a matter of fact, the land squadrons of the R.N.A. had been working so closely together with the R.F. during the latter part of 1917, that many of them we already accustomed to Army ways and so the amalgamati caused little difficulty. Only after the R.A.F. came in being, and the Personnel Department, in an earnest desi to produce true amalgamation, began appointing Arn officers to seaplane stations and seaplane officers to Arn squadrons, did real trouble arise.

The first Air Force Estimates were introduced to t House of Commons on February 21, 1918. As the count was at war, no actual figures were given, the votes being taken in what is called "token" form. But t average level of intelligence shown in the debate was ve much that indicated by the reports published in THE AER PLANE two or three weeks ago.

Early in March an official memorandum was issued setti forth the Constitution of the Royal Air Force. Army ran were then adopted throughout the Force. One of the wo features of this arrangement was that all kinds of que civilians who were brought into the R.N.A.S. as R.N.V. officers, and because of their civil official positions we given two or two-and-a-half or three stripes in the R.N.V. suddenly blossomed forth as captains and majors and lieu colonels. But after all, there were plenty of techni civilians employed by the R.F.C. who bore Army ran with equally little right.

THE R.A.F.

The actual title of the Royal Air Force was confirmed the King in a notice which appeared in *The London Gaze* of March 15, 1918, and so at the beginning of the financ year, on April 1, 1918, the Royal Air Force came into bein

The title as such was eminently suitable. But the initi were heartily disliked, for in the minds of all concern with flying they had long stood for the Royal Aircraft F tory, on whom rightly was cast the blame for the traged caused by the ineffective equipment of the R.F.C., and the intrigues and inefficiency which delayed the producti of adequate fighting machines. The Raf engine alone w enough to condemn the initials.

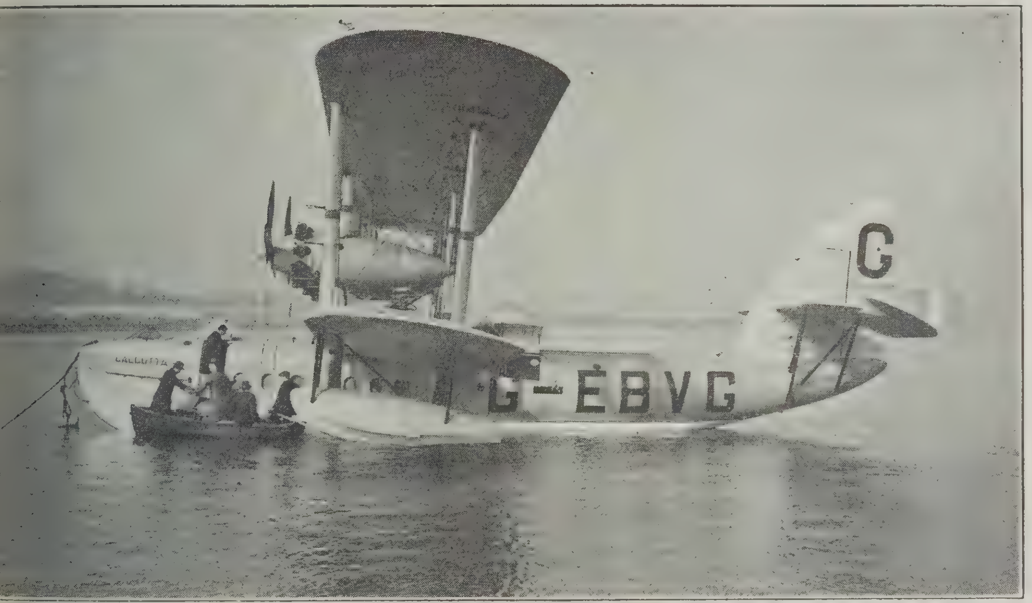
To prevent confusion, the original R.A.F. was thereaft called officially The Royal Aircraft Establishment, and unc its new name did little to remove the obloquy which it h earned.

Of the work of the new R.A.F. during the rest of t War there is no need to write in detail. The R.F.C. squa

IN THE ADEN COMMAND.—The officers of No. 8 (Bombing) Squadron which has recently moved from Hinaidi, 'Iraq, to Aden. The defence force at Aden is now under the command of an R.A.F. officer. No 8 Squadron is commanded by Sq. Ldr. W. A. McClaughry, D.S.O., M.C., D.F.C., and is equipped with Fairey III.F machines (Napier Lion engines).—*(R.A.F. Official Photograph.)*

ROTHERS

design and supply of
the British Air Services



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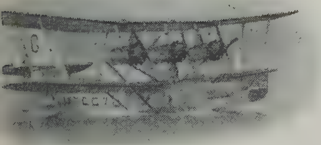

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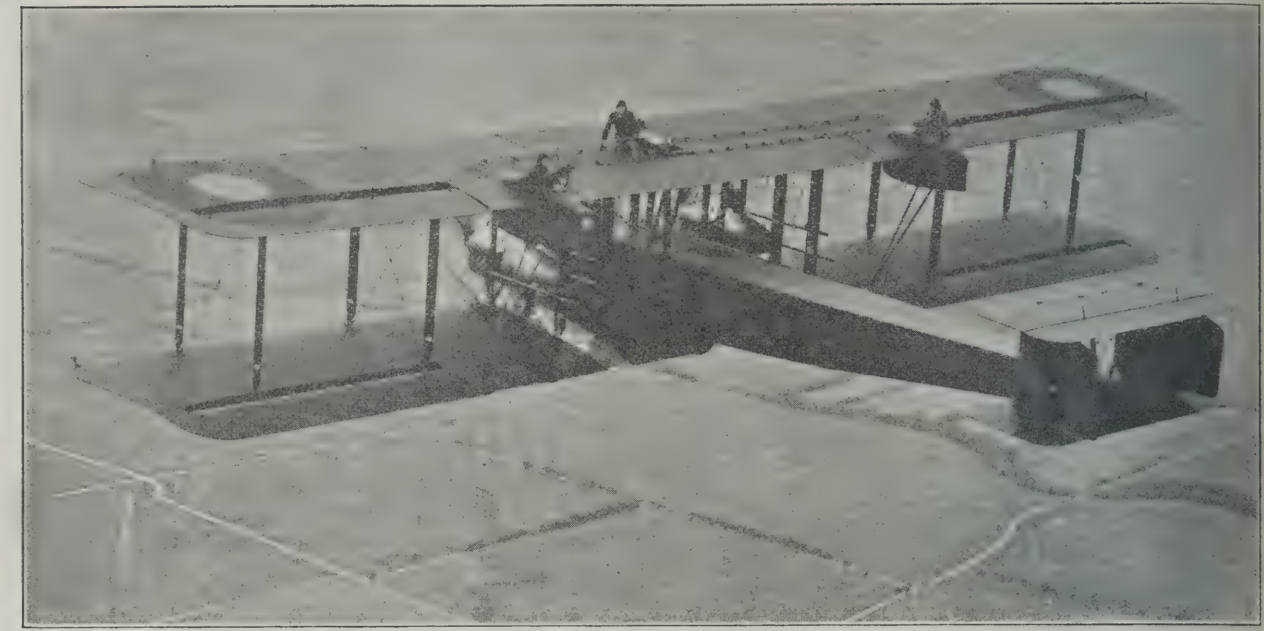


ARMAMENT.—An experimental Vickers Virginia (two Napier Lion engines) of No. 9 (Bombing) Squadron, fitted with gun turrets on the top plane, undergoing trials at Manston.

rons kept their old numbers and the R.N.A.S. squadrons were numbered from 201 upwards with the numbers which they had borne in the R.N.A.S. Thus No. 1, R.N.A.S., became No. 201, R.A.F., and so on.

The Rift in the Foundation.

But at home things were not going so happily. On Sunday, April 14, 1918, the country was staggered by the announcement that Major-General Sir Hugh Trenchard had resigned the post of Chief of the Air Staff, and that Major-General F. M. Sykes, C.M.G., had been appointed in his stead. The effect of this announcement was startling.

General Trenchard had commanded the R.F.C. in France from the middle of 1915 until the end of 1917, when he came home to be Chief of the Air Staff. During that time he had won not only the confidence but the personal affection of all ranks in the field. When he came home everybody felt that if we had to have a Royal Air Force it would at any rate be a sound affair with Sir Hugh as Chief of the Air Staff, and that the R.A.F. in the field would be thoroughly well handled by his successor, Major-General John Salmond. And all seemed to be going well.

On Apr. 15, in answer to a question in the House by Mr. W. Joynson Hicks (now Sir William, and Home Secretary), Major J. L. Baird (now Lord Stonehaven, and Governor-General of Australia) announced that General Trenchard's resignation resulted from the fact that he took a view of the powers and the duties of the Chief of the Air Staff which the Secretary of State of the Royal Air Force could not accept.

The situation was made more acute by the prompt resignation of Sir Godfrey Paine and Sir David Henderson from th Air Council, as a protest against the treatment of Sir Hug Trenchard.

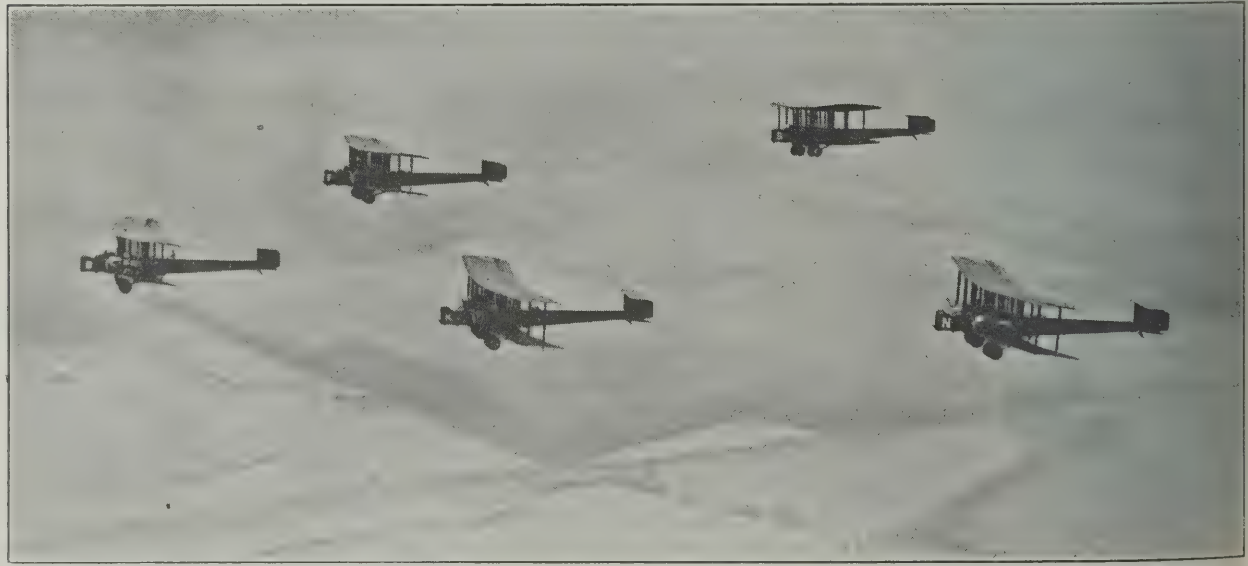
Even Members of Parliament knew enough about th affairs of the R.A.F. to realise the seriousness of the situation. And such portions of the Press as were not immediatel under the thumb of either the Harmsworth Combine or M Lloyd George helped the House of Commons in raising a first class political storm.

In earlier crises of the War, when a politician or a Genera or an Admiral came to be disliked by the Harmswort Brothers, a newspaper campaign had always begun agains him—as in the notorious "Balfour Must Go" affair—and i due course he went. Evidently the Chief of the Air Staf with the experience of years of savage warfare behind hi saw what was likely to happen, and, in the picturesqu American phrase, "stood from under," leaving the blow t fall on its instigator.

The result of it all was that on Apr. 25, Lord Rothermer resigned the office of Secretary of State for the Royal Ai Force and immediately afterwards Sir William Weir was appointed in his stead.

Then came a brief period of discussion as to how Sir Hug Trenchard was to be employed. Obviously he was much to valuable to be put on the shelf, apart from the fact that i such a thing had happened there would have been somethin very like a mutiny in the R.A.F.

First of all the new Air Minister proposed that he shoul again take over the command of the R.A.F. in France, som



"PER NOCTEM VOLAMUS" (The Motto of No. 9 Squadron).—A formation of Vickers Virginias (two Napier Lion engines) of No. 9 (Bombing) Squadron which is stationed at Manston, Kent, and is commanded by Wing Cdr. C. C. Durston.

A REVIVAL.—The personnel and a Handley Page Hyderabad (two Napier Lion engines) of No. 10 (Bombing) Squadron, R.A.F., which was re-formed last January at Upper Heyford, Oxfordshire. The original No. 10 Squadron, a Unit of the R.F.C., was formed at Netheravon in 1915, and went overseas in June, 1916, equipped with B.E.2cs. It was disbanded in 1919. The present Squadron is commanded by Wing Cdr. H. R. Busteed, O.B.E., A.F.C. *(R.A.F. Official Photograph.)*

suitable job being found for General Salmond. But Sir Hugh naturally refused to supplant an officer who had served under him and with him so loyally. Ultimately an ingenious scheme was worked out by Sir William Weir.

The Independent Force, R.A.F.

Sir Hugh Trenchard was to be put in command of a large force of bombing machines, with a complement of protective fighters, and this Independent Force was to operate from aerodromes in the extreme East of France against the German munition-producing areas and against lines of communication in Germany, without reference to the Army Commanders in France—except, of course, that it would operate in close relation with them to produce such effects as would be most valuable to the general strategy of the war.

Looking through back numbers of The Aeroplane one is interested to find that on May 1, 1918, one ventured to suggest that the proper appointment for General Trenchard was Commander-in-Chief of the Allied Air Forces, and that what General Foch was on the ground General Trenchard should be in the air Part of the unpublished history of the War is that some few months later, when the Allies were laying their plans for a campaign in 1919, and before the Germans looked like asking for an armistice, the arrangement was definitely made that Sir Hugh Trenchard should be Generalissimo of the Air.

The R.A.F. in Being.

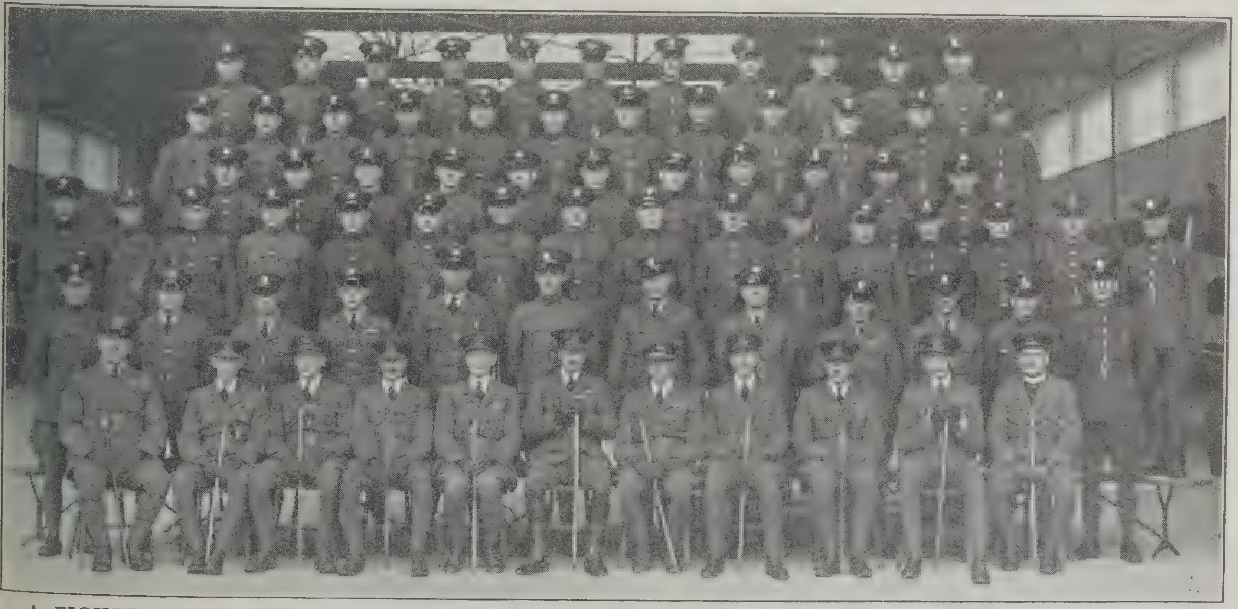
Thenceforward all went well with the Royal Air Force. Sir William Weir, who was created Baron Weir of Eastwood, with that boundless energy for which he was remarkable, proceeded to push along not only the production of material for the Air Force, but the whole scheme for enlarging the R.A.F.

The training system was improved, and new pilots went out to France far better trained than they had done in the dangerous times of 1916 and 1917. Machines were better, engines more more reliable.

Under General John Salmond in France the re-inforced Air Force swept everything before them. In Palestine, under General Geoffrey Salmond the Air Force practically had things all their own way, until, in General Allenby's last big advance, they did such execution that an Infantry Officer, who had been through the pass where the R.A.F. had bombed the retreating Turkish Army, remarked to a senior officer in the R.A.F., " Your men aren't soldiers, they are butchers."

And so the R.A.F. came happily to the end of the War. The Independent Force, R.A.F., never grew to the size which it was intended to be. But it was, in fact, the first properly organised Air Force to carry on air war without being directly under the orders of the Senior Services. And so it was the true nucleus of the R.A.F. as it is to-day.

On his return from Active Service Sir Hugh Trenchard



A FIGHTER SQUADRON.—The personnel of No. 17 (Fighter) Squadron which is stationed at Upavon, Salisbury Plain, and was commanded at the time of this photograph by Sq. Ldr. John Leacroft, M.C. The Squadron is equipped with Hawker Woodcocks (Bristol Jupiter engines).

was again appointed Chief of the Air Staff by Lord Weir,—and Sir Frederick Sykes, who had succeeded him under Lord Rothermere, was created Controller-General of Civil Aviation.

A Reversion to Chaos.

With 1919 came a reversion to primæval chaos. The one aim and object of roughly 75% of the R.A.F. was to get out of uniform and go home. The bulk of the aircraft mechanics were men who had been conscripted out of other industries and had jobs waiting for them. Many of the officers, especially those who had never been to the War, also had assured employment. Some pilots thought that there was a fortune to be made out of Civil Aviation and bustled out of the R.A.F.

But, of course, there was the usual official mis-management in the Civilian departments. Men who wanted to get away could not and men who wanted to stay were thrown out. Whole Stations went Bolshevik bodily over the delay.

There is a delightful story about one station the men of which paraded, all in proper order under their own N.C.O.'s, in front of the Station headquarters, and sent spokesmen to say that they were going on strike. The Commanding Officer, at once a tactician and a humorist, instead of losing his temper and abusing them, merely answered, "Very well, let's all go on strike. But, if we do, where you are going to get your rations to-morrow or your pay at the end of the week, Heaven only knows." And that was the end of that.

Reconstruction.

However, about the end of 1919 things were fairly well straightened out. With that passionate love for disarmament which is characteristic of the British Nation, the Air Force was cut down to about one-tenth of its ordinary size, and the Chief of the Air Staff was left with the problem of making it into an adequate force.

It was no new task for him. In August, 1914, when every aeroplane in England was flown to France at the outbreak of War, Major Hugh Trenchard was left behind at Farnborough with a row of empty sheds and two or three unfit officers to rebuild a Flying Corps from nothing and re-inforce the First Four Squadrons which had gone to France. And he did it.

The task in 1919 was a heavy one. Practically all the best mechanics had gone. The squadrons were living in war-time huts which leaked both wind and rain. The machines were built of war-time emergency material. Everybody was suffering from war nerves and was only accustomed to war discipline. The whole thing had to be built up from the beginning. And it had to be done without enough money.

To add to the trouble, the Navy, which had awakened in the last months of the War to the value of aircraft in sea warfare, began using all the immense political pull of the Admiralty to get back a Naval Air Service of its own.

In spite of all its troubles the R.A.F. won through. With the whole-hearted support of successive Air Ministers, whether Conservative, Liberal or Labour, the Air Council steadily stuck to its programme. First of all adequate barracks and workshops were built for training mechanics. Then the habitations of the flying-training schools were improved. A Cadet College and a Staff College were formed.

When something like an adequate supply of properly trained mechanics was available, money was spent on new experimental machines and engines, and more pilots were trained. The much abused Short Service system for officers was introduced, by which scheme alone an adequate reserve of still comparatively young pilots could be built up.

Esprit de Corps.

The fine War-time tradition of the R.A.F. was maintained by keeping on the active list those squadrons which had most distinguished themselves in war, and disbanding the less distinguished. Which is why the squadrons of to-day are not numbered consecutively.

We have the first seventeen squadrons, of the early days of War. Then we go on to 19 and 20. Next come 22 to 32 inclusive. Then 39, 41, 43, 45, 47 (odd numbers only), and then jumps to 55, 56, 58, 60, 70, 84, 99, 100, 111—all old R.F.C. Then come 207, 208, and 216, the relics of the R.N.A.S.

Each squadron has (or should have) its own war history well drilled into the younger officers and men. There is plenty of material for *esprit de corps,* and if it is lacking at all it is the fault of the individual Squadron Leader.

And so we find ourselves to-day, ten years from the formation of the R.A.F., with an Air Force which, though smaller than that of one other Nation, is, at any rate, the best organised, the best trained, and the best disciplined Air Force in the World.

One other Nation has certain machines which can beat us on performance, but no other Nation has machines or engines which are better built or more reliable.

Much of the present effectiveness of the R.A.F. to-day is due to the advance we in this country have made in the building of engines. The Napier Lion and the new Rolls Royce Falcon, among water-cooled engines, and the Bristo Jupiter and the Armstrong-Siddeley Jaguar among the air cooled, has each in turn been in front of all competitors in its own class. And as competitors have threatened to bea the performances of our engines, we have again advanced to the first place.

The R.A.F. has also the advantage of having been continually at war during the whole ten years of its existence. There can hardly be in the R.A.F. a pilot with more than two years service who has not flown over hostile territory and over hostile fire from the ground.

That at any rate is better training than most other Air Forces have had. At least it has taught our people to see that their machines are properly maintained and has taugh them to keep awake over hostile territory.

One does not pretend that everything is perfect in the R.A.F We might perhaps have a higher average level of military intelligence among the officers, and better manners and discipline. We might easily have machines with higher performances. But all that is coming steadily. And at the end of its first ten years of existence those who are responsible for the efficiency and effectiveness of the R.A.F. may fairl claim that all is going well with the Air Force.—C. G. G.

ON ACTIVE SERVICE.—Sq. Ldr. F. H. Coleman, Flg. Off. L. R. Mizen and two mechanics with two D.H.9as of No. 30 (Bombing) Squadron during the R.A.F. operations against the Wahabis in February, 1928. Sq. Ldr. Coleman was awarded the D.S.O. for service in the Penjwin area of 'Iraq in April, 1927.

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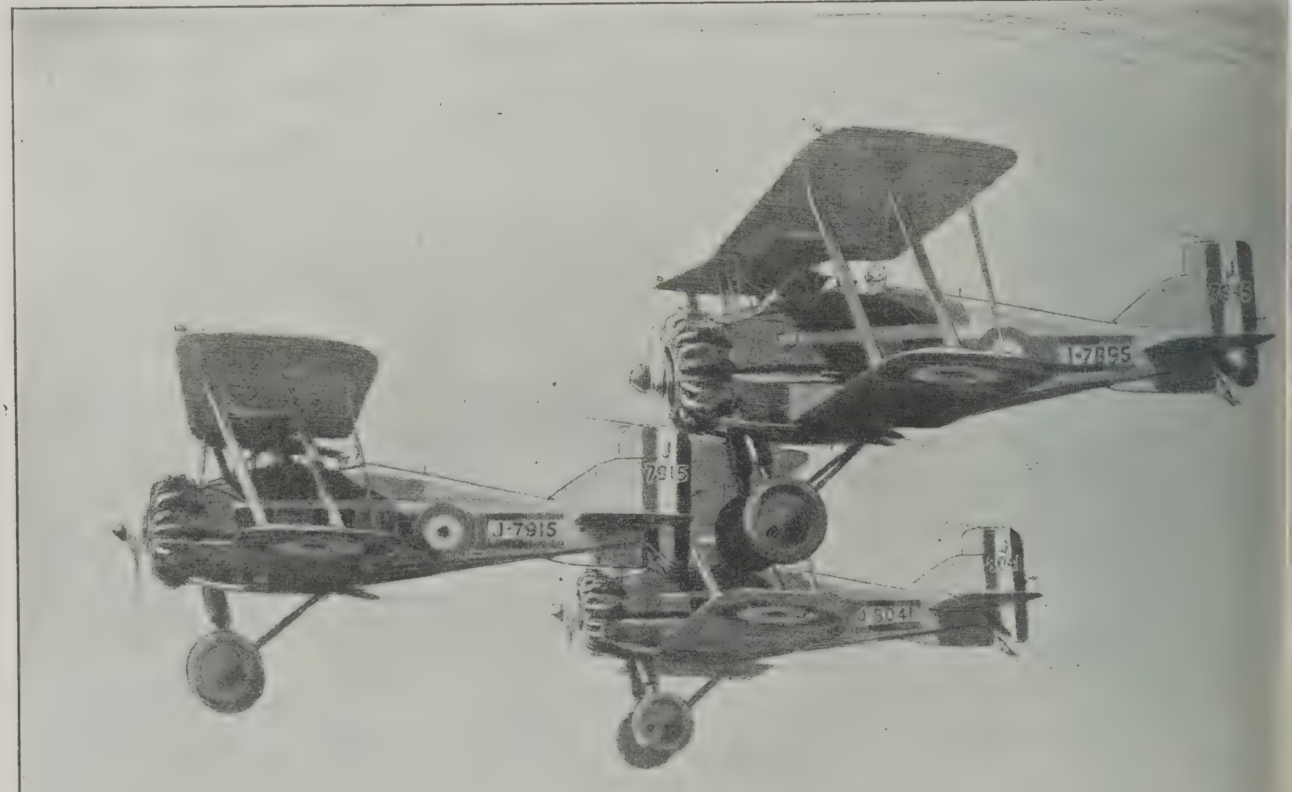
SBAC

PROGRESS.

THEN.—Spad single-seat fighters of No. 23 Squadron in April, 1918. In the last week of the month this type of machine was replaced by the Sopwith Dolphin.



NOW.—Gloster Gamecocks (450 h.p. Bristol Jupiter engines) the present equipment of No. 23 (Fighter) Squadron. This Squadron is stationed at Kenley and is commanded by Sq. Ldr. A. G. Jones-Williams, M.C., R.A.F.

THE MONGOOSE

THE Mongoose is one of the Armstrong Siddeley range of air-cooled radial engines, the reliability, performance, economy of running and general ease of maintenance of which are known all over the world.

This 125 h.p. engine is particularly suitable for use on land training aircraft, for which purpose the Dutch Government have recently ordered a substantial number.

MAIN FEATURES:

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540 cubic ins. = 8.85 litres
125 h.p. at normal r.p.m. 1620.
Weight 340 lbs. = 153.8 kilograms.
Petrol Consumption, .58 pints per h.p. hour.
Oil Consumption, .025 pints per h.p. hour.

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THE FIRST TEN YEARS.

By C. M. McAlery.

Nineteen-Eighteen.

The Royal Air Force came into being on April 1, 1918, and on that date His Majesty the King sent the following telegram to Lord Rothermere, the Secretary of State for the R.A.F. :—

> To-day the Royal Air Force, of which you are the Minister in charge, comes into existence as a third arm of the defences of the Empire. As General-in-Chief I congratulate you on its birth, and I trust that it may enjoy a vigorous and successful life. I am confident that the union of the Royal Naval Air Service and the Royal Flying Corps will preserve and foster that *esprit-de-corps* which these two separate forces have created by their splendid deeds.—George, R.I.

The Royal Air Force was dealt a staggering blow in the first month of its life by the resignation of Major-General Sir Hugh Trenchard, the Chief of the Air Staff, who had come home in January 1918 to take over that post, handing over the Command of the R.F.C. in the Field to Major-General John Salmond. In the House of Commons on April 15 Major Baird stated that General Trenchard " took a view as to the powers and duties of the Chief of the Air Staff which the Secretary of State for the Royal Air Force could not accept."

On the same day Major-General F. H. Sykes was appointed Chief of the Air Staff *vice* Sir Hugh Trenchard. Ten days later Lord Rothermere resigned his post of Secretary of State for the Royal Air Force and Sir William Weir was appointed to succeed him. Shortly afterwards Sir William Weir was created Baron Weir of Eastwood, in recognition of his services in promoting the production of aircraft.

On May 13 General Sir Hugh Trenchard was appointed to the command of the Independent Air Force, a force which had been formed to carry out the definite policy of bombing German munition industries. The Independent Air Force at that time consisted of the four Squadrons which constituted the VIII Brigade under Brig.-General C. L. N. Newall at Ochey. To the Units of this Brigade were added six more Squadrons after Sir Hugh Trenchard took over the command.

The Squadrons and their equipment were then as follows : No. 55 Squadron, D.H.4s, No. 216, No. 97, No. 215 and No. 115 Squadrons, Handley-Pages, No. 100 Squadron, F.E.2bs, No. 99, No. 104 and No. 110 Squadrons, D.H.9s, and No. 45 Squadron, Sopwith Camels.

During the five months of its existence the Independent Air Force dropped 550 tons of bombs of which 160 tons were dropped by day and 390 tons by night. The casualties sustained by the Squadrons of the Independent Air Force were heavy.

The reorganisation at home which followed the formation of the Royal Air Force included the division of the British Isles into five Areas each sub-divided into Training, Operations and Technical Groups.

At the same time that the Royal Air Force came into being the Women's Royal Air Force was formed to effect the substitution of women for airmen in certain trades throughout the R.A.F. Before the Force was disbanded in September 1919 a total of 556 officers and 31,764 other ranks had served in the W.R.A.F.

On May 19, as the result of the effective organisation of the London Air Defence Area under Brig.-General E. B. Ashmore, the last aeroplane raid on London took place. Two attempts to raid England by airship were made during the following August but they were both driven off by R.A.F. Units working with the Fleet and two of the airships were destroyed.

On June 3 the new decorations and medals known as the Distinguished Flying Cross, the Air Force Cross, the Distinguished Flying Medal and the Air Force Medal were instituted.

Units of the Royal Air Force were fighting in France and Flanders, in the Mediterranean and in Home Waters, in Palestine, Egypt, Mesopotamia and Salonika and in Italy at this time.

On July 2 Field-Marshal Sir Douglas Haig telegraphed to Major-General John Salmond, G.O.C., R.A.F., France, as follows :—

> I wish to express my high appreciation of the brilliant work performed by the Royal Air Force throughout the recent operations. By defeating the enemy's aircraft, and thereby carrying out the important work of observation without interruption, and by harassing the enemy's movements by bombing and machine-gun fire, the Royal Air Force have rendered all-important assistance to the other arms. Their constant success has greatly encouraged their comrades in the field. I cannot express in terms of sufficient strength my admiration for the gallantry and skill of all ranks of the Royal Air Force.

New dress regulations introducing the blue uniform for the R.A.F. came into force during August.

The activity and efficiency of the Royal Air Force increased day by day during that summer and in September the Archangel front was added to the field of its operations.

During September 548 enemy machines were destroyed on the Western front. The record bag for the R.A.F. however was on October 30 when 65 German aeroplanes were destroyed in the air, 15 were driven down out of control and two were destroyed on the ground. On that day eighteen British machines failed to return.

On October 23 H.R.H. Prince Albert flew to France to join the Independent Air Force.

Up to the early morning of November 11, when the Armistice was declared, the Units of the R.A.F. maintained their offensive against the enemy.

Official figures show that between January 1 and November 11, 1918, the R.A.F. (including the R.N.A.S. and R.F.C. before April 1) destroyed 3,539 enemy machines and drove down 1,251 out of control. In this period 1,420 British machines failed to return.

The total casualties of the Royal Air Force between April 1 and November 11 were 7,589 all ranks killed, wounded, missing, prisoners or interned, of which 1,551 officers and 1,129 other ranks were killed.

At the time of the Armistice the strength of the R.A.F. on the Western front alone included 95 Squadrons in seven Brigades and 25 Wings apart from Depots, Aircraft Parks, Repair Units, Port Detachments, etc. The *personnel* of the Royal Air Force had almost reached the total of 300,000.

Immediately after the Armistice the Royal Air Force provided and maintained an aerial mail service between London and Paris for the convenience of members of the Government and of the Headquarters Staff of the Air Ministry.

On December 12 Major-General W. G. H. Salmond, Brig.-General A. E. Borton, Capt. Ross Smith and two mechanics arrived in Delhi on a Handley-Page aeroplane (Rolls-Royce engines), having flown from Cairo. This was the first flight from Egypt to India.

ALTIBUS NOCTIS (The Motto of No. 58 Squadron).—The personnel and one of the Vickers Virginias (two Napier Lion engines) of No. 58 (Bombing) Squadron which is stationed at Worthy Down, Winchester, and commanded by Wing Cdr. E. W. Norton, D.S.C.

A PRACTICE CAMP.—The crews (pilots and air gunners) of the twelve machines of No. 39 (Bombing) Squadron at the Practice Camp at North Coates Fitties, in Lincolnshire, in the summer of 1927.

Nineteen-Nineteen.

The year 1919 opened with the publication on January 1 in *The London Gazette* of the first despatch from an Air Force contingent working independently of the Army and Navy. This was a dispatch from Major-General Sir Hugh Trenchard, and covered the operations of the Independent Air Force from June 5 to November 11, 1918.

In the New Year Honours List Major-General J. M. Salmond was made a K.C.B.

On the reconstruction of the Government in the middle of January the Right Hon. W. S. Churchill was made Secretary of State for War and for Air, with Major-General J. E. B. Seely as Under-Secretary of State for Air and to preside in that capacity over the Air Council. The Marquess of Londonderry was appointed to represent the Air Ministry in the House of Lords.

On February 12 Major-General Sir Hugh Trenchard was again appointed Chief of the Air Staff, which not only gave a feeling of confidence and security to the *personnel* under his command but established the Royal Air Force on secure foundations in the estimation of the older Fighting Services.

When the Air Estimates were introduced in March it was found that the *personnel* of the R.A.F. was to be reduced to 5,300 officers and 54,000 men. The Air Estimates amounted to £66,500,000.

In the middle of April No. 47 Squadron R.A.F., which had been fighting in the Balkans since September 1916, moved to South Russia to take part in General Denikin's campaign against the Soviet Government. Certain officers were transferred from No. 17 Squadron and went with them. This squadron served in South Russia with great gallantry and distinction until October 1919.

Seaplanes of the R.A.F. also served in the Caspian during General Wrangel's war.

At the same time other R.A.F. Units were working with he Allied Forces in North Russia, under General Ironside.

In July H.M. Airship R.34 flew from East Fortune to Long Island, U.S.A., commanded by Major G H. Scott, A.F.C., and with Brig-Gen. E. M. Maitland as a passenger.

At the end of July regulations for appointing officers to temporary commissions in the R.A.F. were made and a Reserve was organised

On August 4 the new Rank Titles for the R.A.F. came into force. They were apparently an attempt to combine Naval and Military rank titles with a reminiscent dash of R.N.A.S. and R.F.C. appointment titles and, although the past ten years has in some marvellous and merciful way mellowed them, they are still clumsy and vaguely incredible to the older generation of Service people.

On August 6 Air Vice-Marshal Sir Hugh Trenchard was included in the list of monetary grants made by Parliament to the most successful military leaders and received £10,000. He was at the same time created a Baronet and promoted to be Air Marshal, thus acquiring rank with but after a Lieut.-General in the Army, and raising the R.A.F. to the dignity of an Army Corps.

During the summer of 1919 Royal Air Force Units took an active and distinguished part in the Fleet operations against the Soviet forces in the Baltic and on September 4 British seaplanes bombed Kronstadt.

At the end of September for motives of economy the Government stopped the airship programme although it was not until October, 1921, that the airship stations at Howden and Kingsnorth were handed over to the Admiralty.

In October the W.R.A.F. was finally disbanded.

The service dress uniform of the R.A.F. was again redesigned.

The Coastal Area, R.A.F., to include all R.A.F. Units working with the Navy was organised.

H.M. Airship R.38 was sold to the U.S. Navy.

In November aircraft of the R.A.F. took part in the punitive action against the Wazirs and Mahsuds on the North-West frontier of India.

FLYING KIT.—A group of pilots of No. 39 (Bombing) Squadron. The pilots are wearing the seat-type of parachute and the observers the lap-type. No. 39 (Bombing) Squadron is under orders for India.

At the end of the year Air Marshal Sir Hugh Trenchard issued a Memorandum outlining the permanent organisation of the Royal Air Force. This memorandum provided for the establishment at home in 1920-21 of a striking force of two squadrons, two training wings of three squadrons each, one Army co-operation squadron, one squadron and four flights for Naval co-operation, one communication squadron, four experimental stations and one airship station.

It also provided for, at home, Schools of Naval and Military Co-operation, Technical Training Centres for men and boys, Electrical and Wireless and Photographic Schools, a Cadet College, a Navigation School and an Officers' Administrative School, a Flying Instructors' School and various repair Depots.

Abroad it provided for eight squadrons and one depot in India, three squadrons and one depot in Egypt, three squadrons and a depot in Mesopotamia and seaplane flights at Malta, at Alexandria and on an aircraft-carrier in the Mediterranean.

In the middle of November an Air Force Unit consisting of 22 officers and 159 other ranks under the command of Group Capt. R. Gordon, with Wing Cdr. Bowhill as his Chief of Staff, embarked in H.M.S. *Ark Royal* and sailed for Egypt to take part in the operations against the so-called "Mad Mullah" in Somaliland. The equipment of the expedition was 12 D.H.9 machines with Puma engines. The expedition arrived at Berbera on the last day of the year.

Nineteen-Twenty.

The Somaliland Campaign, the general plan of which was prepared under the direction of the Chief of the Air Staff, was brought to a successful conclusion in three weeks early in 1920. Air operations had reduced the Mullah, who had been a power in the land and a thorn in the flesh of the Protectorate for seventeen years, to a fugitive outlaw.

The demobilisation of the war-time R.A.F. was almost complete by this time and on January 3, 1920, the announcement was made that up to that date 26,087 officers and 21,259 cadets and 227,229 other ranks had been demobilised.

In January the British Section of the inter-Allied Aeronautical Commission began operations in Germany.

On February 2 the Royal Air Force Cadet College at Cranwell was opened. The first Commandant was Air Commodore C. H. Longcroft.

In March the Air Estimates were issued and provided for a total personnel for the R.A.F. of 29,730 as against the 150,000 estimated for the previous year. The net total of the Estimates was £54,030,850.

In April the Marquess of Londonderry was appointed Under-Secretary of State for Air in the place of Major G. C. Tryon. During this month regulations were issued for the full-dress uniform of the R.A.F.

On July 3 the first R.A.F. Display, known in that year as the R.A.F. Tournament, took place at Hendon and 60,000 people were present. In the middle of that month the R.A.F. Athletic Association held its first Championship meeting.

In October the new constitution of the Air Council was published

It provided for the following members :—One of His Majesty's Principal Secretaries of State (President); the Parliamentary Under-Secretary of State for Air; the Chief o the Air Staff; the Controller-General of Civil Aviation; the Director-General of Supply and Research, and the Secretary of the Air Ministry.

In November regulations were issued which extended the right of entry into the R.A.F. with Short Service Commissions to civilians. The Short Service Commission system does not exist in either of the other Fighting Services and has produced a great deal of controversy. In many ways it is an unsatisfactory scheme, although the Air Staff have made every effort to make it acceptable to the Service and to the individual. In view of the tremendous wastage o pilots in time of war there seems to be no alternative method of building up a sufficiently large reserve.

Nineteen-Twenty-one.

Early in 1921 Mr. Winston Churchill left the Air Ministry and was succeeded as Air Minister by Capt. the Hon Frederick Guest. Lord Londonderry was succeeded at the same time by Lord Gorell.

On February 25 the R.A.F. was honoured by the appointment of Air Marshal Sir Hugh Trenchard to be Chief Ai Aide-de-Camp to the King.

The Air Estimates this year amounted to a net total o £18,411,000.

During March and April a survey party of the R.A.F operated between Ramleh and Baghdad for the purpose o marking out a permanent route for the Desert Air Line. On June 30 the first R.A.F. official flight was made over th Desert Route. Three Service machines left Baghdad a 04.30 hours and reached Cairo at 19.45 hours on the sam day.

On July 2, the second R.A.F. Display (this time called Pageant) was held.

On July 27 Air Commodore E. R. Ludlow-Hewitt, C.M.G D.S.O., M.C., was appointed Air Aide-de-Camp to the King

On August 24 the airship R.38 which had been sold t the U.S. Army and re-christened Z.R.2 broke in the air a Hull, and killed 15 officers and men of the U.S. Navy, an 27 officers and men of the R.A.F., including Air Commodor E. M. Maitland, R.A.F., and Commander Maxwell of th U.S. Navy.

In September the Air Ministry announced its intentio of training non-commissioned officers of the R.A.F. as pilots After a certain period of training and duty as pilots thes N.C.O.s revert to their original trades.

In October the important announcement was made tha the British Forces in 'Iraq were to be placed under the control of the Royal Air Force. 'Iraq which had up to tha time been part of the Middle East Area was made into separate command, and Air Vice-Marshal Sir John Salmon was appointed to command the new Command. This wa the first occasion on which an R.A.F. officer had been place in command of a District and Units of the other Services The R.A.F. Establishment in 'Iraq was increased to eigh Squadrons, and a marked decrease in the strength of th British and Indian Army Units there became possible.

At the same time the R.A.F. in India was re-organised an a detached Flight was posted to Aden.

"HIC ET UBIQUE" (The Motto of No. 84 Squadron).—The officers of No. 84 (Bombing) Squadron, R.A.F., at Shaibah, 'Iraq. No. 84 Squadron is commanded by Sq. Ldr. F. T. Vincent, D.F.C., and is equipped with D.H.9as.

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which will set all doubts at rest.

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In November aircraft observers were made a specialist branch of the Royal Navy. This was one of the first moves made by the Navy in their effort to establish a separate Naval Air Service.

In December the Air Ministry held a competition at Farnborough to try to discover a fire-proof aeroplane petrol tank.

At the end of the year the first Boxing Tournament for the Wakefield Trophies for novices, which have done so much to encourage boxing in the R.A.F., was held at Halton.

Nineteen-Twenty-two.

In the course of the Debate on the Naval Estimates in the House of Commons in March, 1922, Mr. Austen Chamberlain, the Leader of the House, made a statement on behalf of the Government which stabilised the position of the Royal Air Force in the defence of the country. He said that the Government had arrived at the following conclusions :—

> In the first place that the Air Force must be autonomous in the matters of administration and education. Second t in the case of defence against air raids the Army and Navy must play a secondary *rôle*. Third, that in the case of military operations by land or naval operations by sea, the Air Force must be in strict subordination to the general or admiral in supreme command. Fourth, that in other cases, such as the protection of commerce and attacks on enemy harbours and inland towns, the relations between the Air Force and the other Services shall be regarded rather as a matter of co-operation than of the strict subordination which is necessary when aeroplanes are acting merely as auxiliaries to other arms.

Mr. Chamberlain concluded his remarks by saying :—

> To sum up what I have said, the Government believe that to abolish the Air Ministry, to re-absorb the Air Service into the services of the Army and Navy would be a fatally retrograde step.

The Air Estimates were introduced in March and amounted to a net total of £10,895,000.

On April 4 the R.A.F. Staff College at Andover was officialy opened by Air Vice-Marshal Sir John Salmond. The first Commandant was Air Commodore H. R. M. Brooke-Popham. The R.A.F. Staff College was, and still is, housed in the war-time huts at Andover.

In the first half of this year all R.A.F. Units were withdrawn from Ireland on the formation of the Irish Free State. The R.A.F. did not return to Ireland until 1925, when No. 502 (Ulster) Bombing Squadron, the first Unit of the R.A.F. Special Reserve, was formed at Aldergrove, Co. Antrim, Northern Ireland.

On May 23 *The London Gazette* announced the promotion of Air Marshal Sir Hugh Trenchard to be Air Chief Marshal, the Air Force rank equivalent to that of a General in the Army.

At the end of June the third R.A.F. Pageant was held at Hendon and a general re-union of the Flying Services was held on the eve of it. This re-union was later to become the R.A.F. Dinner Club, an institution which makes possible an annual gathering for all War-time officers of the R.A.F., R.N.A.S., and R.F.C. The founders of this institution were Wing Cdr. M. G. Christie, later Air Attaché at Washington, and Sq. Ldr. Vivian Robeson, since deceased.

In August the Committee of Imperial Defence announced the decision to provide a force of 500 machines for Home Defence at a cost of £2,000,000 per annum.

Various tests were made by the R.A.F. during August, by permission of the Admiralty, in dropping of small practice bombs from aircraft onto H.M.S. *Agamemnon* and H.M.S. *Opportune* off Gosport.

In September the first troopship to carry R.A.F. *personnel* exclusively sailed for Basrah with 1,000 officers and men on board.

October 1 was the date on which the R.A.F. in 'Iraq was officially designated the 'Iraq Command, and Air Vice-Marshal Sir John Salmond's appointment to command was notified. Thenceforward the R.A.F. took complete control of the peace of 'Iraq, instead of being subordinate to the Army.

In November the new Conservative Government came into power and Sir Samuel Hoare was appointed Secretary of State for Air, and His Grace the Duke of Sutherland was appointed Under-Secretary.

In December the announcement was made that H.R.H. the Prince of Wales, K.G., had been appointed a Group Captain in the R.A.F.

Nineteen-Twenty-three.

In the beginning of 1923 the Reserve of Air Force Officers (R.A.F.O.) was formed and arrangements were made whereby flying schools run by civilian firms would give refresher courses to Reserve Officers. Schools were opened by the De Havilland Aircraft Co. Ltd. at Stag Lane, by the Bristol Aeroplane Co. Ltd. at Filton, by Armstrong Whitworth Aircraft Ltd. at Coventry, and by William Beardmore and Son Ltd. at Renfrew before the end of the year.

The Air Estimates introduced in March were for £12,011,000.

During the spring the R.A.F. took a valuable part in the military operations in Waziristan. No. 27 and No. 28 Squadrons were concerned, and General Lord Rawlinson of Trent, Commander-in-Chief in India, made many references to the work of the R.A.F. in his report on the operations which ended in April.

From February to April, 1923, the R.A.F. Command in 'Iraq, under Air Vice-Marshal Sir John Salmond, carried out successful operations against Sheikh Mahmoud, Governor of Sulaimaniyah in South Kurdistan. The first phase of these operations concluded with the occupation by the R.A.F. of Rowanduz. The second phase began in April and continued until June, when they were brought to a successful conclusion. The names of a number of officers and men of the R.A.F. appeared in *The London Gazette* of June 10, 1924, as having been awarded decorations for distinguished service during these operations.

In the King's Birthday Honours in June Air Vice-Marshal Sir John Salmond was promoted to the rank of Air Marshal.

Nineteen-Twenty-four.

Two new R.A.F. Reserve Training centres were opened in the first few weeks of 1924, one at the headquarters of the Blackburn Company at Brough and one at the Avr Works in Manchester.

The new Labour Government came into being on January 23 and Brig.-General C. B. Thomson, C.B., D.S.O., C.B.E. was appointed Secretary of State for Air, with Mr. William Leach as Under-Secretary of State for Air. A Barony wa conferred on Brig.-General Thomson in February.

The Air Estimates net total for 1924 were £14,511,000, a increase of over two millions on the previous year.

In March Major-General E. B. Ashmore, who had commanded the London Air Defence Area in the latter part o

NEMO ME IMPUNE LACCESSIT (The Motto of No. 100 Squadron).—Three Hawker Horsleys (Rolls-Royce Condor engines) of No. 100 (Bombing) Squadron in flight formation. No. 100 Squadron is stationed at Bicester, Oxfordshire, and is commanded by Sq. Ldr. L. T. N. Gould, M.C.

INNOVATION.—Three Vickers Vimy (two Rolls-Royce Eagle engines) of No. 216 (Bombing) Squadron flying in formation near the Pyramid of Cheops, near Cairo. The shadow of the fourth machine from which the photograph was taken may be seen.

the War, was appointed General Officer Commanding the Territorial Army Air Defence Brigade.

The Auxiliary Air Force and Air Force Reserve Bill was introduced into the House of Commons in the middle of March.

On March 13 the appointment of Air Vice-Marshal J. F. A. Higgins to be Air Officer Commanding the 'Iraq Command *vice* Air Marshal Sir John Salmond was announced.

In April a party of R.A.F. Officers from the R.A.F. Staff College under Air Commodore H. R. M. Brooke-Popham visited various military establishments in France. The party flew to France in D.H.9a machines of No. 39 Squadron.

At the end of April a Fleet Order establishing the new Fleet Air Arm was published. H.M.S. *Hermes,* the first ship to be designed and built as an aircraft-carrier, was commissioned and joined the Atlantic Fleet in February, and in June H.M.S. *Eagle,* an aircraft-carrier, converted from a battleship, completed her trials.

In the King's Birthday Honours Air Vice-Marshal Philip Game was made a K.C.B.

In June a new scheme of entry into the R.A.F. Cadet College was introduced. This scheme did away with the special tuition previously required.

The R.A.F. Pageant this year included a parade of experimental types for the first time. The Experimental types on this occasion were the Grebe, Woodcock, Bullfinch, Dormouse, Venture, Andover, Possum, Hyderabad, Brandon and Pixie. The massed formation known as "Wing Drill by two Squadrons" was also a new feature of the Pageant.

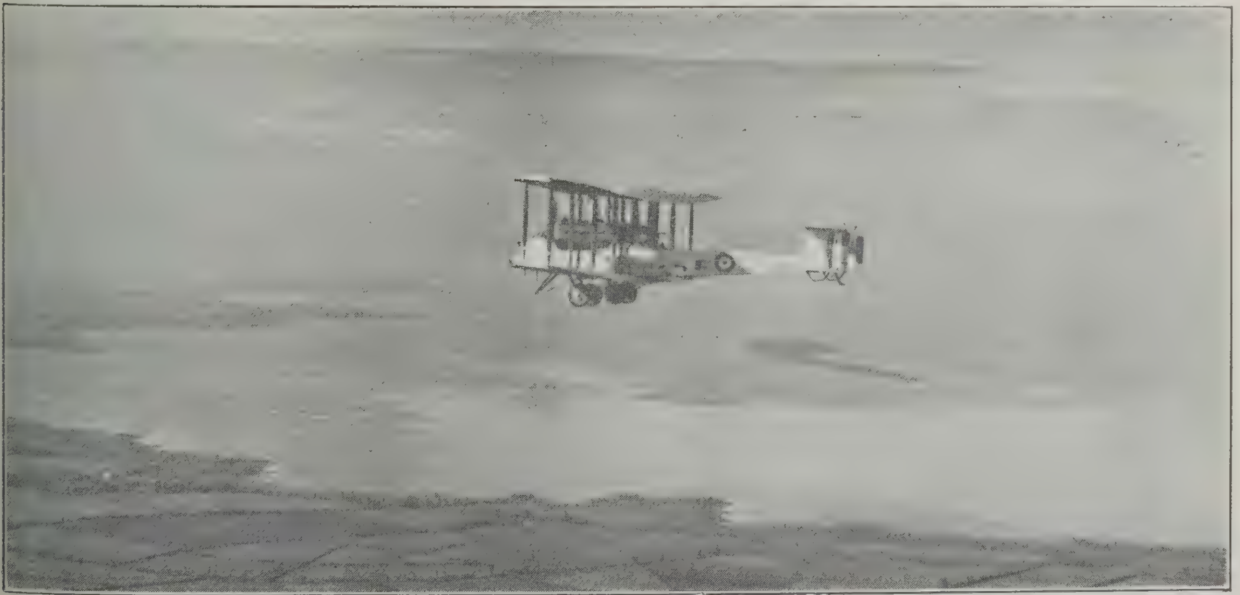
The Labour Government decided to revive airships, and Group-Captain P. F. M. Fellowes was appointed Director of Airship Development.

In July the R.A.F. took part in the Naval Manœuvres in Weymouth Bay and in the Naval Review at Spithead.

Two Fairey III.D seaplanes from Malta paid a semi-official visit to the French Seaplane Base at Tunis.

The Shabai tribesmen south-east of Razmak were bombed by the R.A.F. at the end of July, and in August R.A.F. machines defended the Beni Sakr tribes against the Wahabis.

Fighting, assisted by air reconnaissance, machine-gunning from the air, and armoured-car action took place against



THE ULSTER SQUADRON.—A Vickers Vimy of No. 502 (Ulster) Bombing Squadron flying over Belfast Lough. No. 502 Squadron was the first Unit of the R.A.F. Special Reserve to be formed and is stationed at Aldergrove, Co. Antrim. It is commanded by Wing Cdr. A. C. Wright, A.F.C., and equipped with Vickers Vimys (two Rolls-Royce Eagle engines) and Avro training biplanes.—*(R.A.F. Official Photograph.)*

THE CITY OF LONDON SQUADRON.—The training machines of No. 600 (City of London) Bombing Squadron. Auxiliary Air Force, at Lympne during the summer training in 1927. No. 600 Squadron is stationed at Hendon and commanded by Sq. Ldr. the Rt. Hon. F. E. Guest, P.C., C.B.E., D.S.O., M.P.

the Wahabis in Transjordania. The official version of the affair issued by the Palestine Government ended with the statement :—

> The prompt and energetic action of the Air Force reinforcing the local tribesmen averted a serious menace to the peace of the country and the safety of the capital.

R.A.F. machines were also reported in action near Mosul during September.

In the middle of September Lord Thomson, Secretary of State for Air, left for a tour by aeroplane of the R.A.F. Stations in the Middle East. He left London on September 17 and travelled overland to Alexandria. He visited Abukir and flew to Heliopolis. From there he flew to Amman, Ramadi and Baghdad. After inspecting the units in Baghdad he flew to Mosul, Zakho, Erbil, Rowanduz and Kirkuk. The next day he flew to Sulaimaniyeh. He also made the return journey to Cairo by air.

In October, on the return of the Conservative Government, Sir Samuel Hoare was again appointed Secretary of State for Air and Sir Philip Sassoon was appointed Under-Secretary.

An arrangement whereby graduates of the universities could be granted commissions in the R.A.F. with an allowance of seniority for certain qualifications was made at the end of this year.

Nineteen-Twenty-five.

The new Home Defence organisation came into operation in 1925 under the command of Air Marshal Sir John Salmond, Air Officer Commanding-in-Chief Air Defence of Great Britain, with temporary headquarters at the Air Ministry. This was the first move in the Air Ministry scheme for concentrating all defence units, including fighting and bombing squadrons and anti-aircraft units under a single command.

In the New Year Honours Air Vice-Marshal J. F. A. Higgins, A.O.C., 'Iraq, was made a K.C.B.

In his speech introducing the Air Estimates Sir Samuel Hoare said that he hoped to have 54 Squadrons for Home Defence within the next five years. The strength of the Air Force in squadrons at that time was 54 of which 8 were in 'Iraq, 6 in India and 4 in Egypt and Palestine. The Estimates themselves amounted to £15,513,000.

The scheme for the admission to Cadetships at Cranwell of certain Aircraft Apprentices from the Schools of Apprentices at Halton, Cranwell and Flowerdown by competition came into force.

The first issue of a standard service parachute to the R.A.F. was made in 1925. The Irving, an American type, was chosen after exhaustive trials of other makes, and arrangements were made for a quantity of these parachutes to be manufactured in this country. The supply was limited to begin with, but the parachutes were issued first to the pilots of experimental machines. The wearing of parachutes as soon as they were available for all members of the crews of Service aircraft was made compulsory.

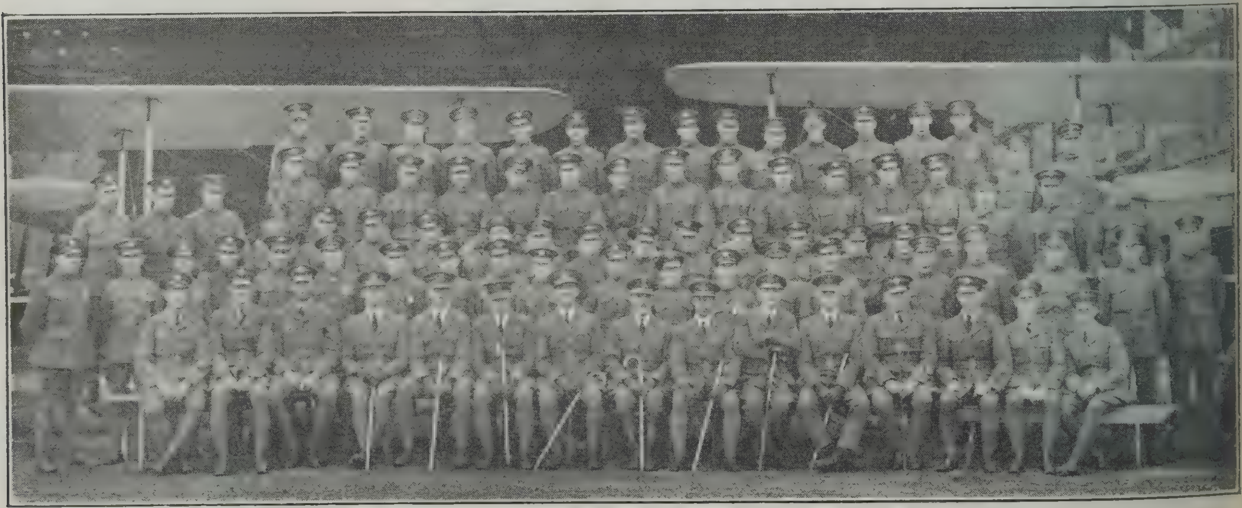
In February as the result of a number of raids and other lawless actions by the Mahsuds from Waziristan the Royal Air Force began operations against the offending tribes. The operations were successful by the beginning of May.

The force employed in the operations consisted of a Headquarters, one Army Co-operation (No. 5) and two Bombing Squadrons (No. 27 and No. 60). The total strength of the force consisted of 26 aeroplanes, 47 officers and 214 airmen and was under the command of Wing Cdr. R. C. M. Pink. This was the first time that the R.A.F. had operated in India without supporting troops. And the Commander-in-Chief in India, in his report, said that the results obtained had been most satisfactory.

In February Air Marshal Sir John Salmond was appointed Principal Air Aide-de-Camp to the King *vice* Air Chief Marshal Sir Hugh Trenchard.

In April the airship R.34 with a crew of 20 on board under Flt. Lt. R. S. Booth, R.A.F., broke from her moorings at Pulham and after cruising about over the North Sea without her nose for 24 hours was navigated back to Pulham and safely put into her shed.

During the Easter Recess Sir Samuel Hoare, Secretary



AUXILIARIES.—No. 602 (City of Glasgow) Bombing Squadron, Auxiliary Air Force, at their aerodrome at Renfrew, Scotland. No. 602 Squadron is commanded by Sq. Ldr. John Fullerton and is equipped with Fairey Fawns (Napier Lion engines) and Avro training machines (Armstrong-Siddeley Lynx engines).

COASTAL RECONNAISSANCE.—A Supermarine Southampton flying-boat (two Napier Lion engines) of the R.A.F. Base, Calshot.—*(R.A.F. Official Photograph.)*

State for Air, travelled 3,500 miles in Service aircraft in tour of the R.A.F. Stations in the Middle East.

The R.A.F. Pageant this Summer was renamed the R.A.F. splay. Wing evolutions by four bombing squadrons was a w feature, and there was also a display of parachute drops.

In September a cruise of 2,500 miles round the South of ngland to the North of Ireland and Scotland was made by ur flying-boats from Calshot. They were refuelled at sea roughout the cruise.

The first of the Annual Service Exercises between Cairo and ano began on October 27 and ended on November 19. The ight consisted of three D.H.9a aeroplanes and was commanded by Sq. Ldr. A. Coningham. They flew 5,600 miles.

Nineteen-Twenty-six.

The reorganisation of Home Defence which began in 1925 s expanded in 1926. Three subordinate commands known the Fighting Area, the Wessex Bombing Area and the ecial Reserve and Auxiliary Air Force, were formed. The uadron strength of the Air Defence of Great Britain increased by two regular squadrons and two special reserve uadrons.

In the New Year Honours Air Vice-Marshal W. G. H. Salmond was made a K.C.B.

The Estimates amounted to a net total of £16,000,000 for the year.

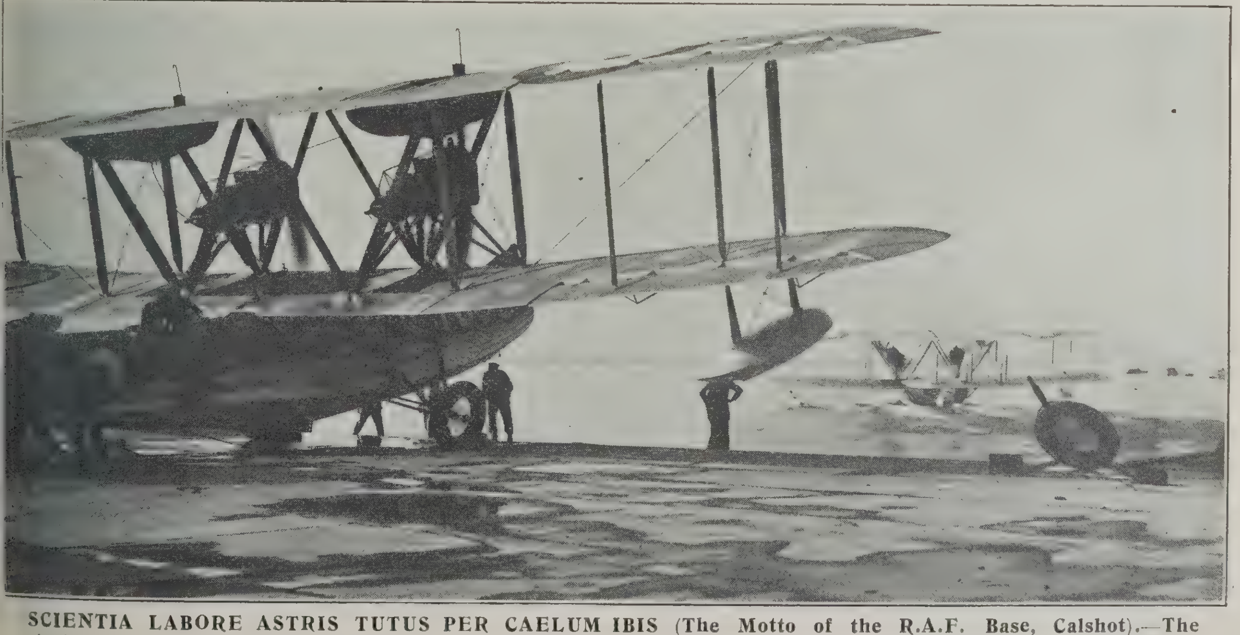
Parachutes became the standard equipment of all R.A.F. units, and courses in packing and fitting parachutes and jumping-off practice was held at many stations.

Long-distance flights were made from Cairo to the Cape and back (in Fairey III.D landplanes), round the Mediterranean and round the coast of Great Britain (in Supermarine Southampton flying-boats) and from Cairo to Aden and back (in Vickers Victorias)—all with Napier engines.

In January, 1926, the new College of Imperial Defence was opened. An officer of the R.A.F. was appointed to be one of the instructors and four R.A.F. officers were posted to attend the first course.

The Central Flying School which had been at Upavon since 1912 was moved to Wittering in Northamptonshire.

The R.A.F. in Palestine and Transjordan were amalgamated into one Group under the Middle East Area.



SCIENTIA LABORE ASTRIS TUTUS PER CAELUM IBIS (The Motto of the R.A.F. Base, Calshot).—The start of a daily coastal reconnaissance by Supermarine Southampton flying-boats (two Napier Lion engines) from Calshot. The R.A.F. Base at Calshot, which is commanded by Wing Cdr. F. E. T. Hewlett, D.S.O., O.B.E., also administers No. 480 (Coastal Reconnaissance) Flight. —*("Aeroplane" photograph.)*

The Auxiliary Air Force and the R.A.F. Special Reserve were increased by one Squadron each in October.

The intensive technical training of Aircraft Apprentices in the R.A.F. was more than fully justified by the award at the R.A.F. Cadet College of the Sword of Honour, the Groves Memorial Prize, the Fellowes Memorial Prize and the Air Ministry Prize to a former apprentice from Halton.

Nineteen-Twenty-seven.

The beginning of 1927 was marked by the promotion of the Chief of the Air Staff to the rank of Marshal of the Royal Air Force, the highest rank in the Service, being the equivalent to an Admiral of the Fleet or a Field Marshal.

In January a new Bombing squadron, No. 10, was formed at Upper Heyford, near Oxford, there to be equipped with Hyderabads

At the end of January a detachment of officers and men were ordered to China to supplement the R.A.F. Unit in H.M.S. *Hermes*. A Command known as the R.A.F., China, with Headquarters at Hong Kong was formed, and included Units of the Fleet Air Arm in the aircraft-carriers, H.M.S. *Hermes* and H.M.S. *Argus*, and in H.M.S. *Vindictive* and H.M.S. *Enterprise*.

A net total of £15,550,000 was provided by the Estimates.

No. 2 (Army Co-operation) Squadron, R.A.F., sailed for China in April and joined the Shanghai Defence Force. It returned to Manston in October.

During the early summer No. 45 (Bombing) Squadron moved from 'Iraq to Helwan, Egypt, to replace No. 47 (Bombing) Squadron which had moved to Khartum.

A new Group known as No. 1 Air Defence Group was formed in August under Air Commodore E. L. Gerrard to include the Auxiliary Air Force and Special Reserve Units.

In July the first annual tactical exercises of the Air Defence of Great Britain took place and involved all the organisation of the Fighting and Bombing Areas, R.A.F., and the Ground Forces of the London Defences. A number of valuable lessons was learned.

In September the Schneider Trophy was won at Venice by Flt. Lt. Webster, a member of the British team consisting of R.A.F. personnel trained as the High Speed Flight at Felixstowe. The machine was a Supermarine S.5 (Napier Lion engine).

During August and September the R.A.F. undertook a successful flying-boat cruise of the Baltic ports.

On October 1 the Far East Flight left Cattewater for a cruise of 23,000 miles before taking up its station at Singapore. The Flight is equipped with metal-hulled Supermarine Southamptons (Napier engines) and reached the end of the first stage of its cruise without mishap and according to programme.

A new Army Co-operation Squadron, No. 26, was formed in October and stationed at Catterick, an R.A.F. station just re-conditioned.

The Service flight of three machines from Cairo to Kano and back started in October but met with various misfortunes and only one machine returned.

A number of Squadrons received new equipment duri the year, which from this point of view has been the mo progressive of the ten.

Nineteen-Twenty-eight.

Various important announcements concerning the Ro Air Force have marked the beginning of 1928.

The Defences of Aden have been placed under the co mand of a Royal Air Force Officer and No. 8 (Bombin Squadron has been added to the establishment of the Co mand.

The India office has announced that two more R.A. Squadrons are to be sent to India during 1928. The Squadrons will be drawn from the Air Defence of Gre Britain and will be replaced later.

A new Squadron, No. 101, is still in process of bei formed at Eastchurch and a non-regular squadron, No. (Special Reserve), is being formed at Hucknall, near N tingham.

In March the Annual Service flight from Cairo to t Cape began and three of the four machines arrived saf at Cape Town on March 21. Air Vice-Marshal Webb-Bowe A.O.C. Middle East Area, is personally in command.

Air operations against the Wahabis took place in Februa and March and a machine belonging to No. 55 Squadr was shot down and the pilot was killed fighting after landir

The Air Ministry announced in March that a new syste of promotion in the R.A.F. would shortly come into for

The Air Estimates, issued in March, amounted to a total of £16,250,000.

An attempt was made on March 12 at Calshot to beat t World's Speed Record. Unfortunately the machine w wrecked and the pilot, Flt. Lt. Kinkead, R.A.F., was kill

On March 17 the R.A.F. gave a Display at Hendon honour of the King and Queen of Afghanistan.

THE AIR COUNCIL.

The present constitution of the Air Council is as follows

The Right Honourable Sir Samuel John Gurney Hoa Bart., G.B.E., C.M.G., M.P., Secretary of State for A (President of the Air Council.)

Sir Philip A. G. D. Sassoon, Bart., G.B.E., C.M.G., M. Under-Secretary of State for Air. (Vice-President of the Council.)

Marshal of the Royal Air Force Sir Hugh M. Trencha Bart., G.C.B., D.S.O., D.C.L., LL.D. (Col. R. Scots F and Hon. Maj.-Gen. in Army), Chief of the Air Staff.

Air Vice-Marshal Sir Philip W. Game, K.C.B., D.S. *p.s.c.*, Air Member for Personnel.

Air Vice-Marshal Sir John F. A. Higgins, K.B.E., C. D.S.O., A.F.C., Air Member for Supply and Research.

Sir Walter F. Nicholson, K.C.B., Secretary of the Ministry.

THE CHINA STATION.—The personnel of No. 444 (Fleet Reconnaissance) Flight, R.A.F., in H.M.S. "Vindictive." No. 444 Flight is commanded by Flt. Lt. L. G. Maxton, A.F.C., and is equipped with Fairey III.D seaplanes. The Senior R.A.F. Officer in H.M.S. "Vindictive" is Sq. Ldr. E. J. P. Burling, D.S.C., D.F.C., who is seated fifth from the right.

THE NEW WORLD'S RECORD FOR SPEED.

On Mar. 30, Major de Bernardi, flying a Macchi float sea- ane (Fiat AS-3 engine) at the Lido, Venice, beat the World's ecord for Speed by covering the measured three-kilometre urse, according to the rules of the *Fédération Internationale ronautique,* at an average speed of 512.776 kilometres per ur,—which is approximately 318½ miles per hour.

His fastest turn of the course is reported as being at the eed of 561 kilometres (348½ miles) per hour.

Thus he beats his own World's Record of 479.280 kilometres 6.9 miles) per hour.

Our good friends and sportsmanlike rivals the Italian *gia Aeronautica* deserve, and have, from all British sports- n our heartiest congratulations on Major de Bernardi's lendid speed record of 318½ miles per hour.

Our congratulations are also offered to Major de Bernardi mself; to the Macchi firm who built the seaplane; to the at firm who built the motor; to General Verduzio, who, as ief of the Technical Department, had charge of the first velopment of these record-breaking craft; to General idoni, who, as the new Technical Chief, has brought this velopment to a successful conclusion; to General Balbo, Air Minister, who has thrown so much energy into the erations of the *Regia Aeronautica;* and, first and last, to *Il ce,* His Excellency Mussolini, who has been the *fons et go,* the great inspiration, of Italy's great effort in the .

Particularly do we wish to acknowledge the fine feeling Major de Bernardi, and his associates in his work, who, at time when all was ready for their attempt on the record, spended their trials for several days as a mark of respect Flt. Lt. Kinkead.

Major de Bernardi will live henceforth in history as the st human being to have reached, and surpassed, a speed 300 miles an hour. He well deserves the distinction. ring the War 1914-18 he proved himself to be a fighting n of great gallantry. In 1926, by winning the Schneider phy in America he became known to the World as a high- ed pilot of the first class. Since then his reputation has n increased by his continual flying of experimental high- ed machines,—a work of constant danger. At Venice, by way in which he took his defeat, he showed himself a e sportsman. To-day we all rejoice in his victory over e and space.

hat we English have not ourselves the credit of being the t to attain the much-desired 300 miles an hour is entirely own fault.

Ve knew that our machines at Venice could do the speed. instead of sending them for the record a day or two after Schneider Contest, when the International timekeepers, the officials of the *Fédération Aéronautique Internationale,* the journalists of all nations, were on the spot, so that job could have been done under the eyes of all the rld, we left the machines lying in their sheds for the better part of a week before handing them over to slow Naval transport to bring them back to England.

Instead of getting them home quickly and going for the record during that spell of warm calm weather in October, when the air was perfect for speed, we dawdled round and put them away for the Winter.

Instead of pulling them out of store and tuning them up for the first spell of fine weather, such as always comes late in February or early in March, we began the tuning work just when everything was right for the record attempt. And so we killed poor Kinkead by sending him for the record on a day which was about as wrong as it could be.

One says this deliberately, for though no orders were given that he should go on that day, he was faced with the alternative of flying then or of letting the time-keepers and the officials of the Royal Aero Club go home. Which meant that they could not be got together again for days, or weeks, as they had already been hanging round at Calshot so long.

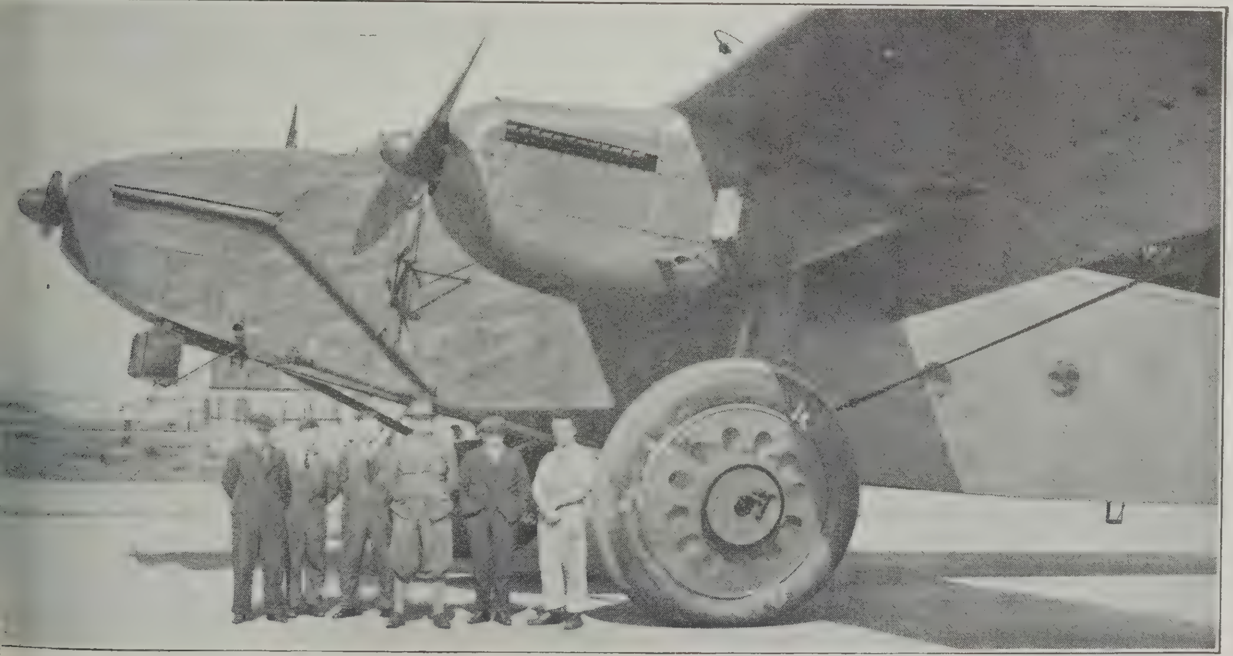
Now that the inquest on that gallant young officer is over, and the suggestion that he was poisoned by ethyl-lead or carbon-monoxide has been refuted, a clearer view can be gained of what did happen. The facts are known that he was ill in the air when practising the previous day, and that he was ill in the Mess after landing, and that he still felt ill on the morning of his death. He should not have flown on that day at all.

Add the facts that the sea was calm and oily, and that the flight was not made till late in the afternoon when there was a slight haze with the sun shining into it, and the only reasonable assumption is that, diving as he did from a height of a thousand feet or so to flatten out at fifty feet above the sea, he never saw the surface at all and drove straight into the water.

Eye-witnesses hold that the machine dived vertically into the sea. That may well be an optical illusion. They, like poor Kinkead, would be unable to see exactly the line between sea and sky. As the machine hit the water it would stand momentarily on end. And the image of the machine in full plan view would naturally remain in their mind's eyes.

The fact remains that a sick man set out on a dangerous flight too late on an unsuitable day, simply to suit the convenience of other people,—and he was killed. He flew under those conditions because the whole business of going for the record was muddled from the moment when the Schneider Trophy was won at Venice.

Truly we are a nation of muddlers,—as the loss of more than half a million lives in the War 1914-18 proved ten years before Kinkead was killed. We muddle because we are too lazy to get ready in time. We may beat the Italian record. But the coveted 300 miles an hour will always belong to de Bernardi. He and his fellow-countrymen have richly earned it. —C. G. G.



THE R.A.F.'S LATEST.—The nose of the Beardmore Inflexible (three 650 h.p. Rolls-Royce Condor engines). The central figure in the group is Sq. Ldr. R. A. de H. Haig, A.F.C.

THE ROYAL AIR FORCE.

The London Gazette.

Mar. 27.

General Duties Branch.—G. F. Simond is granted a perm. comn. in the rank of Plt. Off. with effect from Mar. 16, 1928, and with seniority of Mar. 16, 1927. The following are granted S.S. comns. as Plt. Offs. on probation with effect from and with seniority of Mar. 16:—J. A. G. Baker, H. M. S. Barnard, M. I. Barnett, J. Beaumont, F. A. R. Bishop, B. S. Bramble, W. E. Catling, R. Chadwick, R. D. Cotton, W. J. Crisham, R. S. Darbyshire (Acting Sub-Lt., R.N.R.), F. P. Donovan, H. J. Forster, F. C. G. Freeman, O. V. Garratt, O. I. Gilson, E. S. Greenwood, A. N. E. Hall (2nd Lt., 17th London Regt. (T.A.)), C. P. Hanlon, J. A. Harris, B. W. C. E. Hartwell, E. G. Hitchings, T. R. Hope, H. T. Lines, V. B. Lintott, J. H. Lock (2nd Lt., R. Signals, T.A.), E. D. Mills, R. Mountain, V. H. Nicolay, J. S. Pole, G. E. F. Proctor, J. B. W. Pugh, C. H. Robbins, N. X. Sheldrick, L. H. Snelling, F. B. Taylor, D. Timms, J. G. Walling, R. F. Williams, R. F. A. W. Williams.

The following are granted temp. comns as Flg. Offs. on attachment for four years' duty with the R.A.F. (Mar. 14):—Lt., R.N.—H. C. Toppin. Sub-Lts., R.N.—G. W. Dennis, H. L. Hayes, N. S. Luard, G. R. Maw, G. G. R. Rodd. The following Plt. Offs. are promoted to the rank of Flg. Off. (Jan. 30):—H. Waring, D. N. Roberts, R. P. H. Utley.

Wing Cdr. O. T. Boyd, O.B.E., M.C., A.F.C., is seconded for three years' duty at the Staff College, Camberley (Jan. 21); Wing Cdr. E. L. Gossage, D.S.O., M.C., ceases to be seconded for duty at the Staff College, Camberley (Jan. 21).

The following Flg. Offs. are transferred to the Reserve, Class A:—R. Barrett (Mar. 28); E. F. Mattock (Mar. 31); J. B. L. H. Cordes (Apr. 1); R. B. Fleming (Apr. 1); J. B. Wilson (Apr. 1). Flg. Off. C. F. Caunter relinquishes his S.S. comn. on account of ill-health (Mar. 28).

Stores Branch.—Flt. Lt. G. Baker is restored to full pay from half-pay (Mar. 9). (Substituted for the notification in the *Gazette* of Mar. 13.) Flt. Lt. L. E. Carter, D.C.M., is placed on the retired list on account of ill-health (Mar. 28).

Medical Branch.—Flt. Lt. G. E. Church, M.B., is granted a perm. comn. in this rank (Mar. 28). The following Temp. Lts. (Dental Surgeons, Gen. List) are granted temp. comns. as Flg. Offs. on attachment to the R.A.F. (Mar. 12):—H. E. Glover, G. M. Titterington. Flt. Lt. E. Alston (temp. Capt. Dental Surgeon, Gen. List) relinquishes his temp. comn. on resignation of his Army comn. (Mar. 1). (Substituted for the notification in the *Gazette* of Mar. 13.)

Reserve of Air Force Officers.—General Duties Branch.—The following are granted comns. in Class A.A. as Plt. Offs. on probation (Mar. 14):—F. J. St. G. Braithwaite, J. H. Dixon, D. Price, C. R. F. Wintringham. The following are granted comns. in the Special Reserve as Plt. Offs. on probation:—N. A. Lindley (Feb. 3); R. C. Newton (Mar. 7). The following Plt. Offs. on probation are confirmed in rank:—L. R. Stooke (Mar. 21); B. J. A. Webb (Mar. 22). Flg. Off. T. Brewin is transferred from Class C to Class A (Mar. 11). The following Flg. Offs. are transferred from Class A to Class C:—F. Larman (Dec. 9, 1927); J. C. F. Raine, M.B.E. (Mar. 24); J. Craig (Mar. 27). Flg. Off. H. A. C. Atkinson relinquishes his comn. on account of ill-health and is permitted to retain his rank (Mar. 28); Flg. Off. A. F. Wynne resigns his comn. (Feb. 21); Plt. Off. G. F. Simond resigns his comn. on appointment to a perm. comn. (Mar. 16).

Appointments.

Week ending Apr. 2.

General Duties Branch.—Flying Officers R. A. Barnett, to No. 31 Squadron, India, 23/3. J. C. Cunningham, to No. 20 Sqdn., India, 23/3. L. B. McGoverne, to No. 6 Sqdn., 'Iraq, 9/3.

Plt. Officers J. F. Griffiths, to No. 28 Sqdn., India, 23/3. L. Tindall, to No. 207 Sqdn., Eastchurch, 14/3.

Medical Branch.—Squadron Leaders H. L. Burton, M.B., to Centr Medical Establishment, 18/2. C. P. Barber, to R.A.F. Base, Gospo 23/3. R. W. Ryan, M.B., to No 3 F.T.S., Grantham, 6/4. F. Johnson, to School of Army Co-operation, Old Sarum, 10/4.

Flight Lieutenants R. L. C. Fisher, M.B., to R.A.F. Hospital, Cra well, 5/4. W. D. McKeown, M.B., to No. 45 Sqdn., Middle East, 6 E. J. Jenkins, to No. 216 Sqdn., Middle East, 9/3. J. P. Hederman, R.A.F. Depot, Uxbridge, 12/4.

Flying Officers R. J. I. Bell, to No. 111 Sqdn., Sutton's Farm, 2 R. G. Freeman, to R.A.F. Officers' Hospital, Uxbridge, 26/3. J. Priestley, D.M.R.E., to Princess Mary's R.A.F. Hospital, Halton, 2 F. E. Lipscomb, to R.A.F. Station, Kenley, 2/4. J. Hutchieson, M to R.A.F. Training Base, Leuchars, 25/3. J. Kemp, M.B., to Prince Mary's R.A.F. Hospital, Halton, 2/4. B. B. Kennedy, M.B., to R.A. Depot, Uxbridge, 2/4. J. J. MacAndrews, M.B., to A. and A.E. Martlesham Heath, 2/4. R. F. MacLatchy, M.D., to M.A.E.E., Feli stowe, 2/4. J. B. Murphy, M.B., to No. 1 F.T.S., Netheravon, 2 J. C. Neely, B.A., to R.A.F. Station, Upper Heyford, 2/4. F. O'Connor, M.B., to R.A.F. Depot, Uxbridge, 2/4. Leo. O'Connor, M. to Home Aircraft Depot, Henlow, 2/4. J. J. Quinlan, M. to R.A.F. Depot, Uxbridge, 2/4.

Stores Branch.—Flying Officers W. A. Stagg and C. L. Gilbert, Aircraft Depot, India, 23/3.

A Fatal Accident.

The Air Ministry regrets to announce that as the resu of an accident near Amman, Transjordan, to a D.H. machine of No. 14 (Bombing) Squadron, Amman, on Marc 28, Flt. Lt. George McCormack, the pilot of the aircraf and 349781 L-AC. James Kimberley were killed.

Vacancies for Short-Service Officers.

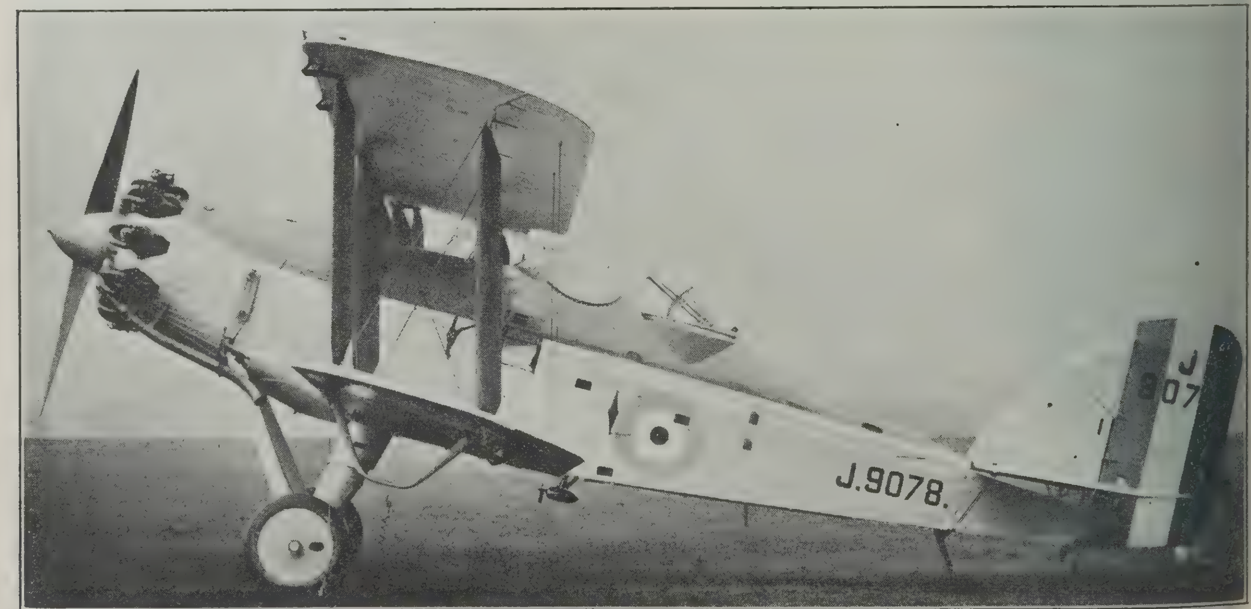
Vacancies exist in the Royal Air Force for 100 more Shor Service Officers during the present year. Of these 40 a required immediately for the first course at the new No. Flying Training School, Grantham. A further 40 are r quired during the next few weeks for the new course No. 4 Flying Training School, Abu Sueir, Egypt. The for Egypt must be over 22 years of age.

Intending candidates for Short Service Commissio should note that the Selection Board are liable to ask que tions about the constitution, organisation and administr tion of the R.A.F. They may also ask where the vario Units of the R.A.F. are stationed, not in detail, but general.

One heard the other day of a certain candidate from o of our public schools who could not say in what countri abroad the R.A.F. were stationed, and on having 'Ir suggested to him, said that he thought 'Iraq was in Sou America. The simplest way to find out a few facts of the sorts is to buy a copy of the current Air Force List a study it with a map. In this way will one question at lea be safely answered.—C. M. McA.

The Royal Air Force Special Reserve.

Air Ministry Orders state that from April 2, 1928, No. 5 (Bombing) Squadron will be known as No. 503 (County Lincoln) (Bombing) Squadron.



NEW EQUIPMENT.—The Westland Wapiti (450 h.p. Bristol Jupiter VI engine), a two-seat General Purpose biplane which is now in production for the R.A.F. It will be noted that it is fitted with the Handley Page automatic slot.

Blackburn
AIRCRAFT

THE DEFENCE of TERRITORIAL WATERS

Immunity from sea attack is best secured by the adequate defence of waters immediately adjacent to the Coast Line. The "RIPON II"– the latest BLACKBURN land or sea alighting Torpedoplane – is built for this purpose, & has been adopted by the British Air Ministry & a number ordered for use in the Royal Air Force & Fleet Air Arm. It is equally suitable as a bomber.

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AMBALA.—Headquarters Flight of No. 31 (Army Co-operation) Squadron at Ambala. No. 31 Squadron is commanded by Sq. Ldr. J. F. Gordon, D.F.C.

Wing Commander Boyd.

Wing Commander O. T. Boyd, O.B.E., M.C., A.F.C., who was announced in *The London Gazette* of March 27 to have been seconded for three years' duty at the Staff College, Camberley, from January 21, was born in Marylebone in 1889. He joined the Indian Army from Sandhurst in 1909 and was posted to the 5th Indian Cavalry at Rawalpindi in the following year. He was seconded to the Royal Flying Corps in April 1916, and appointed Flight Commander in July 1916 and Squadron Commander in October 1916. He served in France from May 1916 to June 1917, and was awarded the Military Cross for conspicuous gallantry in August 1916. In 1917 he was posted to Mesopotamia, and remained there until after the Armistice. For his war service he was made an Officer of the Order of the British Empire and awarded the Air Force Cross. In 1921 he was appointed to the Directorate of Operations and Intelligence at the Air Ministry. In 1923 he was appointed to command the School of Army Co-operation, R.A.F., Old Sarum. In January 1926 he was posted to the Staff College at Camberley for a course which he completed satisfactorily last December.

The Gordon-Shephard Memorial Essay.

The Gordon-Shephard Memorial Prize of 1927 has been awarded by the Air Council for the essay written by Wing Commander L. A. Pattinson, D.S.O., M.C., D.F.C., Headquarters, R.A.F., India.

R.A.F. SPORTS AND PASTIMES.

Association Football.

R.A.F. versus Army.—The Army beat the R.A.F. Uxbridge on Mar. 28 by six goals to one. *The Tim* account of the game states :—

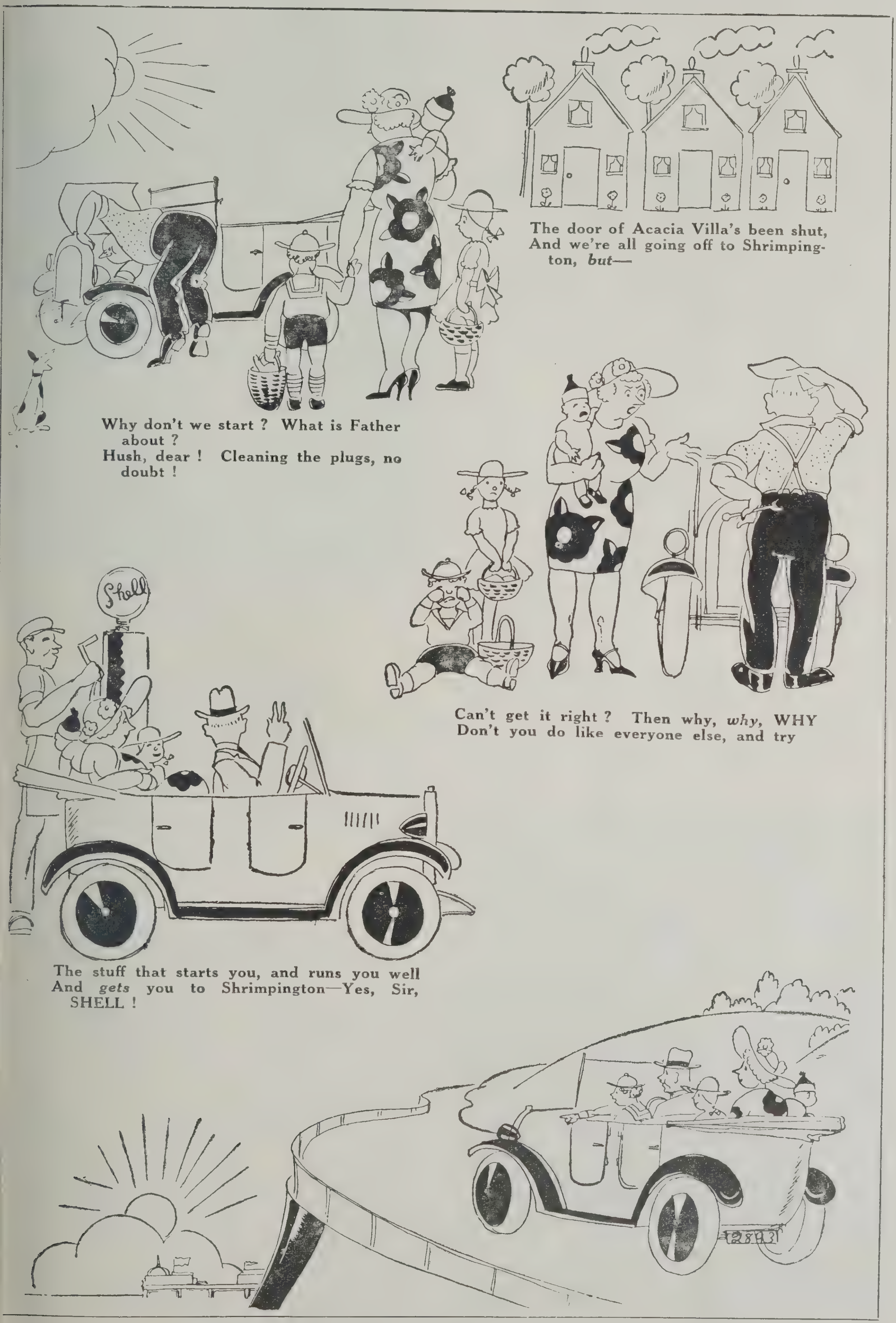
The Army were almost continually pressing in the first half. Aft T. M. R. Briggs had hit the post with a powerful drive from 30 yar out, K. E. Hegan failed to take a chance given him by G. Stockto who shortly afterwards almost headed through from J. Mitchell's pa After good work by Hegan and Stockton had tested the Air For defence L. F. Smith broke away and sent the ball to J. Ewers, w gave the Air Force the lead after 30 minutes' play.

After the interval the Army attack pressed hard on the Air For defence, which gradually broke down under severe pressure. Fi Hegan headed a magnificent goal from a pass by J. McGowan on t opposite wing, then Marks worked the ball into the net duri a scrimmage in front of goal, a moment after Quadling had missed penalty. Mitchell increased the Army's lead shortly afterwards, a before the end Marks scored three more goals. The Army's big sco in the second half was mainly due to fine work by their outsi forwards.

The R.A.F. team were :—

AC. Quadling (Gosport), goal; Cpl. Eager (Hawkinge) and Flt. I S. N. Webster (Martlesham Heath), backs; Sjt. Stewart (Leuchar AC. Robinson (Henlow) and Cpl. Baldwin (Uxbridge), half-back Sjt. Francis (Upper Heyford), AC. Oates (Henlow), AC. Ewers (U bridge), AC. Smith (Martlesham Heath) and AC. Ward (Peterboroug forwards.

INDIA.—A Bristol Fighter (Rolls-Royce Falcon engine) of No. 31 (Army Co-operation) Squadron, flying over the Baleli District at 1,500 ft.



The door of Acacia Villa's been shut,
And we're all going off to Shrimpington, *but*—

Why don't we start? What is Father about?
Hush, dear! Cleaning the plugs, no doubt!

Can't get it right? Then why, *why*, WHY
Don't you do like everyone else, and try

The stuff that starts you, and runs you well
And *gets* you to Shrimpington—Yes, Sir, SHELL!

The Senior Hockey Cup.

The final of the Royal Air Force Senior Hockey Cup was played at Bentley Priory on March 28, when Henlow defeated Gosport by 5 goals to 1, thus retaining the cup for the second season in succession.

Gosport started well and pressed strongly, but the Henlow defence withstood the attack. About 10 minutes after the start AC. Craig opened the scoring for Henlow from a well-directed pass by Flg. Off. Carter. Gosport rallied after this and for a time were having the better of the game and, securing a corner, were unlucky not to score. Later Flg. Off. D. S. E. Vines missed an opportunity for Gosport in front of goal. Henlow failed to take advantage of a good run with only the goalkeeper to beat, but soon after scored their second goal.

On resumption, Gosport pressed strongly again, but the finishing of the forwards was somewhat weak and the game was carried to the Gosport half where, five minutes after the interval, Henlow found the goal again. Gosport were now playing much better hockey and, as a result of a fine bit of combination, scored their first goal, but almost immediately after the bully-off Henlow got well away on the left wing and Flg. Off. Carter, from a very acute angle, scored the best goal of the match. Henlow were now having the better of the exchanges and, although Gosport tried desperately to reduce the lead, the Depot secured their fifth goal.

After the game Air Vice-Marshal C. A. H. Longcroft, C.B., C.M.G., D.S.O., A.F.C., presented the cup to the winners.

AIR AFFAIRS IN PARLIAMENT.

BOMBING TRIALS.

In the House of Commons on Mar. 21,—

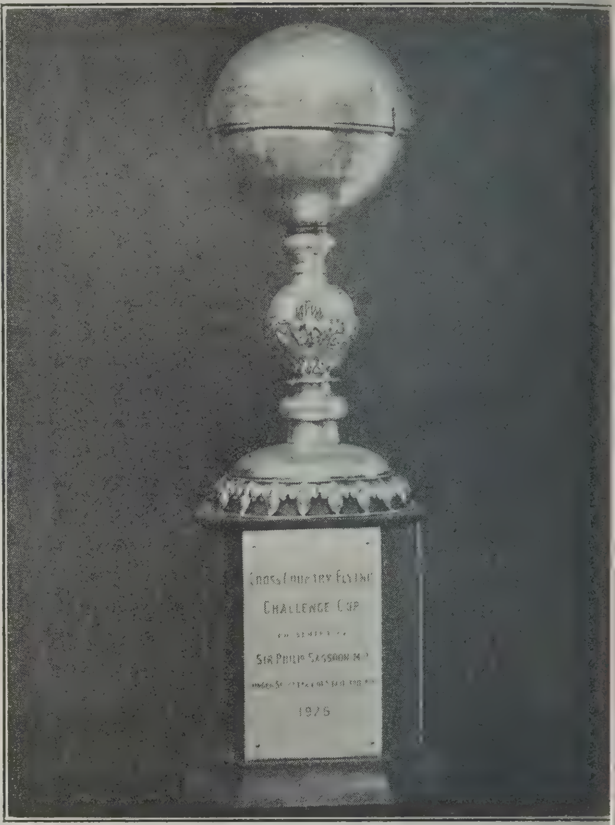
Lt.-Cdr. Kenworthy asked the First Lord of the Admiralty whether any recent experiments have been carried out to test the effect of large bombs dropped from aircraft so as to explode under water on the hulls of large warships; whether, without detriment to the public interest, he can state the conclusions of the Board on this subject; and whether his attention has been drawn to the experiments carried out by the American Government for testing the effects of air attacks of this nature on warships, the details of which have been published?

Mr. Bridgeman: A number of experiments to ascertain the effect on a ship's structure and fittings of bombs exploding below water have been carried out by the Admiralty, and recent design in underwater protection is based on information obtained from these experiments. Research is still being continued on this subject on scale models and special targets. It is not in the public interest that the details of the various experiments carried out and in contemplation should be published. All the published accounts of experiments made by the American Government have been received and noted by the Admiralty; in general they are in accord with the British Admiralty experiments.

Lt.-Cdr. Kenworthy: Is the right hon. Gentleman aware that in the American experiments it has been shown that large bombs dropped in this way could disable or sink the most modern ship, and does the First Lord feel satisfied that experiments on models and in tanks will prove a real test in this matter?

Mr. Bridgeman: I did not say that our experiments were on models. I said that we were quite aware of what has been published by the American Government, and we are keeping our eyes open.

THE SASSOON TROPHY.—Presented by Sir Philip Sassoon for annual competition between Squadrons of the Fighting Area, R.A.F. The trophy was won in 1927 by No. 32 (Fighter) Squadron.



A CROSS-COUNTRY FLYING TROPHY.—Presented in 1926 by Sir Philip Sassoon for competition among Units of the R.A.F. It was won in 1927 by No. 41 (Fighter) Squadron.

CELLULOID WINGS.

A special invitation view of the much-advertised Americ State-aided film "Wings" was given at the Carlton Theat on March 26. The theatre was freely decorated with exc lent models of British aircraft. "Wings" was preced by what the programme claimed to be a brief review of t outstanding events in the history of aviation. It was in fa a very interesting collection of extracts from the Gaumo Graphic news films of the past twenty years, and show flights by the Wright Brothers, Miss Harriet Quimby aligl ing at Boulogne after flying across the Channel, the NC after crossing the Atlantic, and scenes illustrating vario other feats of endurance in the history of aviation.

"Wings" is a notable film because of the magnifice photography. The magnascope, which is an enlarging vice, has been used for the pictures in the air, and t result is that the spectator has the feeling of being in t machine, and consequently very often in the middle of battle in the air. It would be interesting to know how t crashes are faked, because they are obviously not done wi models, and equally obviously the unfortunate actors a not in the machines when they hit the ground. One thi which all flying people will notice when they go to see t film is that in the close-ups of the actors in the machin they are all wearing parachute harness, although when th are seen in the machines about to take off or after landi they are not wearing parachutes.

A number of war-time machines, including a Gotha, a l of Spads, some Fokkers and some S.E.5s. have been us in the film which was taken on and around an Americ Air Service aerodrome in Texas. Most of the flying scen are extraordinarily good, particularly the fights in the a and the contact-patrol scenes in the second half. What known to film-fans as "effects," in other words the nois other than the orchestra, are supplied by Panatrope instr ments belonging to British Brunswick Ltd. The sound the engines running both full-out and ticking-over and t machine-gun effects are particularly good, also the sound bombs dropping, but they have attempted to reproduce t whining noise of the wires heard in a machine when t engine has stopped and have only succeeded in making distracting and unearthly howl. This will probably be i proved later on.

Of the story of the film the less said the better. It like so many American War film stories, a deplorable ma of maudlin sentiment, and bears no relation to life of a sort outside Hollywood.—C. M. McA.

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R.A.F. SINGLE-SEAT FIGHTERS IN 1918 AND IN 1928.

1918.—An S.E.5a single-seat fighter (180 h.p. Wolseley Viper engine) of the 1918 era. The particular machine shown belonged to No. 65 Squadron, R.A.F.

At the time of the formation of the R.A.F. in April, 1918, the single-seat fighter machines mostly in use were the Sopwith Camel, with the 130 h.p. Clerget rotary engine, the S.E.5a with either the 150 h.p. Hispano-Suiza or the 180 h.p. Wolseley Viper, and the Spad biplane with the 220 h.p. Hispano-Suiza engine.

The S.E.5a and the Camel survived to the end of the War, and the Spad was replaced during the last eighteen months of the War by the Sopwith Dolphin, with either the 200 h.p. Hispano-Suiza or the 200 h.p. Sunbeam Arab engine, and the Sopwith Snipe with the 230 h.p. B.R.II rotary engine.

To-day, after ten years' development, the standard Service equipment for single-seat fighter squadrons consists of the Armstrong-Whitworth Siskin IIIa. with the 400 h.p. supercharged Armstrong-Siddeley Jaguar, the Gloster Gamecock with the 450 h.p. Bristol Jupiter VI, the Gloster Grebe with the 385 h.p. Armstrong-Siddeley Jaguar and the Hawker Woodcock with the 450 h.p. Bristol Jupiter IV engine.

In the interval, therefore, the engine-power of this class of machine has increased between two and three times, and consequently, on general principles, there should be a vast improvement in performance. The performance figures of single-seat fighters of ten years ago compared with those of to-day at first sight suggest that progress has not been anything like so rapid as might have been expected.

Martlesham Heath test figures of 1917 show that the Camel with the 130 h.p. Clerget had a maximum speed at 10,000 ft. of 113 m.p.h. and climbed to that height in 10 minutes. At 15,000 the Camel's speed was 106 m.p.h.

The S.E.5a with the 150 h.p. Hispano-Suiza was slightly faster at 10,000 ft., a good deal faster low down, and to
14 minutes to reach 10,000 ft.

Later S.E.5as with the 180 h.p. Viper engine undoubted gave a considerably better climb and speed at height.

There were at this time machines in existence, though n in service, with considerably higher performances.

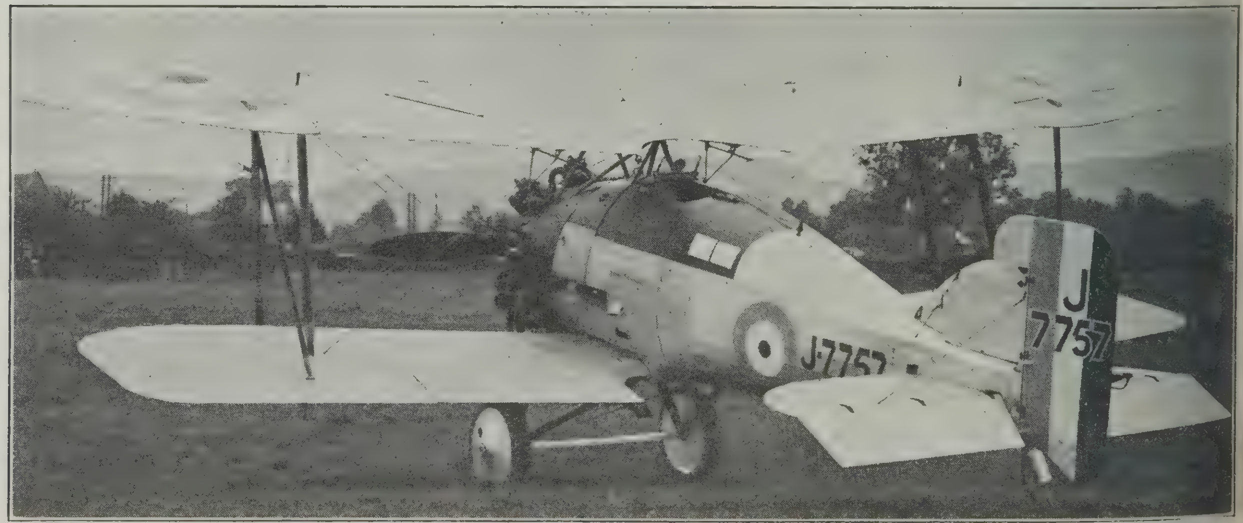
The Sopwith Dolphin with the 200 h.p. Hispano had a spe of 123 m.p.h. at 10,000 ft., of 116 m.p.h. at 15,000 ft., and 111 m.p.h. at 18,000 ft. This machine reached 10,000 ft. 9½ minutes, 15,000 ft. in 17 minutes and 18,000 ft. in minutes.

The Martinsyde F.3, with the 190 h.p. Rolls-Royce Falc engine, a machine which never came into service, thou a variant of the type with a 300 h.p. Hispano-Suiza engine w eventually ordered, had the most remarkable performance all. Her speed at 10,000 ft. was 130 m.p.h., at 15,000 ft. 12 m.p.h., and she could reach 15,000 ft. in 14 min. 20 sec.

[All Falcons were needed for Bristol Fighters, and the 3 h.p. Hispano was not available till after the Armistice. Th same machine with a Jaguar (not supercharged) is fast than any single-seat fighter with an air-cooled engine (n supercharged) in Air Force squadrons to-day.—C. G. G.]

The Gloster Gamecock of to-day with a 450 h.p. Jupit engine, has a speed at 10,000 ft. of 152 m.p.h. and climbs 15,000 ft. in 11½ mins.

Comparing this machine with the Martinsyde it will seen that an addition of over 250 h.p. had increased t speed at 10,000 ft. by only 22 m.p.h. and reduced the ti of climb to 15,000 ft. by under three minutes, which soun an inadequate return for the extra power.



1928.—A Gloster Gamecock (450 h.p. Bristol Jupiter engine) which now forms part of the standard fighter equipment of the R.A.F.

n theory if the Martinsyde had had an engine of 450 in- ad of 190 h.p. without increasing either her all-up weight her resistance, her speed at 10,000 would have increased just about 22 m.p.h., but her time to climb to a given ght would have been reduced by a very much greater portion than is shown in the case of the Gamecock.

hat has happened to single-seat fighters in the past ten rs has been less a development of performance than a dy increase in the amount and weight of the equipment ried, accompanied by an increase in h.p., but not by an rease in the size of the machine itself commensurate with increased loads carried.

he span of the single-seat fighters has remained practically same during the past ten years. For instance the Game- k is slightly less and the Siskin slightly more in span n the ten-year-old Martinsyde F.3.

ingle-seat fighters of 1918 carried fuel for 2 to 2¾ hours' ng at 10,000 ft. Fighters of to-day have about the same lurance, but the weight of fuel has increased in propor- 1 to the engine-power. The Martinsyde carried 240 lbs. fuel and oil as against the Gamecock's 450 lbs.

he 1918 machines carried, over and above their pilots, a itary load (two Vickers guns, ammunition and sundries) about 180 lbs.

he addition of more ammunition, of wireless, of para- tes, and various other equipment, has raised the military l of present-day single-seat fighters to round about lbs.

he modern single-seat fighter carries well over twice the posable load of fuel and military equipment on about same span and the same wing area, with a power ghly in proportion to this disposable load.

o stow the increased load of fuel and of military equip- nt to-day's fighter has necessarily a much larger body n was needed ten years ago—which means increased d resistance. It has a higher wing-loading (on an ave- e about 11 lbs. per sq. ft. as against about 7 to 8 lbs. per ft. in 1918) and its weight has increased from about o lbs. to 3,000 lbs. fully loaded. This means that the ling per foot of span has increased about 50 per cent., with it the induced drag of the wings has increased by per cent.

hese changes in loading tend seriously to spoil the aero- amic characteristics of the modern fighter. The head- stance of a big body is an obvious disadvantage. The n wing-loading (by cutting down the importance of the ile drag, which is mainly skin friction) helps towards attainment of a high top-speed.

he high span-loading and the consequent increase of iced drag is most serious at low speeds, and it is this ch accounts mainly for the comparative lack of improve- nt in climbing speed in the modern fighter.

aking all the factors into consideration it must be said the designers of modern fighters have done well to ure so much improvement in all-round performances as is ally shown.

this connection it should be noticed that the com- son of performance which has been made extends only eights reached by the fighter of ten years ago. Actually modern fighter, and particularly those such as the in III.a, which have supercharged engines, have much er ceilings than their predecessors. Consequently their ormance at heights of over 15,000 ft. are superior to e of the old machines to an extent greater than the es for lower heights would indicate. Unfortunately no ble data for the performance of modern fighters at ex- e heights is available for publication.

is improvement, however, is mainly due to the engine gner, who has produced engines, either supercharged f very high compression ratio, and of very low weight h.p., which will run and maintain their power at low ities and low temperatures very much more satisfactorily did the engines of 1918.

The increase in wing-loading and the use of enlarged bodies in the modern fighter is the inevitable result of the Air Ministry's Service requirements for this class of machine. The demand for extra equipment is a natural development, justified, within limits, by the improvements now possible in the design and construction of both engines and aeroplanes.

The maintenance, in spite of increased weight, in the complete aircraft of practically the same over-all dimensions and wing-area arises in part from the demand for the maximum possible manœuvrability in this type of machine, and in part from a natural desire on the part of the designer to keep down structure weight. Whether the restriction of dimensions has not been carried further than is economical may be questioned.

Increasing the span of the modern fighter would add appreciably to its weight, would probably reduce its maximum speed when below 10,000 ft., but would almost certainly give improved climb and better all-round performance at greater heights,—which is the end chiefly sought in present day machines.

Whether our policy of building high-altitude fighters is sound is another question. Much cheaper machines could be built to be 50 m.p.hr. faster at less than 10,000 ft., and to carry the same effective load. And there is no use in having fighters up at 15,000 feet or more when there is nobody there to fight them and the enemy's machines down below are too fast to be caught.

AIRCRAFT TOURING ABROAD.

The Royal Aero Club as the representatives of the *Fédération Aéronautique Internationale* in Great Britain, issues Customs Carnets for aircraft travelling abroad. The Carnet enables the holder to travel without having to make payments for customs dues on aircraft when arriving in a foreign country. The charge for the Carnet is £1 11s. 6d. and they are not restricted to members of the Club.

In making application for the Carnet the following particulars must be supplied:—(1) Name and address of Pilot. (2) Proposed date of departure from England. (3) Type of Aircraft. (4) Registration mark. (5) Value of Aircraft. (6) Weight empty. (7) Span. (8) Wing Area. (9) Colour of Aircraft. (10) Number of seats (including Pilot's). (11) Type of Engine. (12) Horse Power. (13) Manufacturer's Number.

Applications for Carnets are to be made to the Royal Aero Club, 3, Clifford Street, London, W.1.

INFLEXIBLE WHEELS.

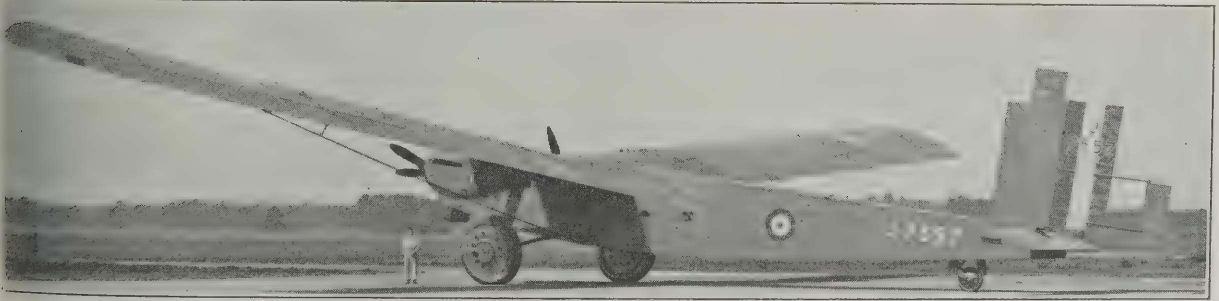
One of the minor but important problems encountered in the design of the Beardmore Inflexible was that of producing suitable wheels for this machine. The Inflexible weighs something like 15 tons. She has but one pair of wheels which are about 7 ft. 6 in. diameter, and these wheels are required to sustain not only landing stresses, but also those caused by the use of landing brakes.

It so happened that the task of producing and testing the first set of these wheels had to be undertaken during the general strike of 1926.

The design of these wheels was undertaken jointly by the staff of William Beardmore and Co. Ltd., designers of the machine, and the Dunlop Rubber Co.

The type of wheel finally adopted has a high-tensile steel rim of the "well-base" type, and a steel hub, which are connected by radial plates of duralumin rivetted in place, and is completed by duralumin disc sides.

Special tools and machinery had to be made to produce these wheels, and the problem was rendered the more difficult by difficulties—caused by the strike—of obtaining satisfactory raw materials. Finally a special testing machine had to be built on which to subject the wheels to their designed loads—which were in the neighbourhood of 50 tons per wheel.



THE BIGGEST EVER.—The Beardmore Inflexible (three 650 h.p. Rolls-Royce Condor engines), the biggest all-metal military aeroplane so far built.

THE WORLD'S DURATION RECORD.

On March 28-30 Mr. E. Stinson and Mr. George Haldeman, flying a Stinson monoplane (200 h.p. Wright Whirlwind engine), beat the World's Duration Record by remaining in the air for 53 hours 36 mins. They took off from Jacksonville, Florida, at 07.37 hrs. and continued flying until they had exceeded by 74 mins. the previous record of 52 hrs. 22 mins. made by Herren Edzard and Risticz in a Junkers monoplane on August 3-5, 1927.

LADY BAILEY'S PROGRESS.

On March 30 Lady Bailey, on her D.H. Moth (A.D.C. Cirrus II engine), flew from Assuan to Wady Halfa, through intense heat and a severe sandstorm, which completely obliterated the ground. She completed the flight in 125 minutes.

On March 31 she flew from Wadi Halfa to Atbara *en route* for Khartum, whence Lieut. Bentley is to escort her over Southern Sudan.

Lady Heath, who is flying northward on an Avro Avian, arrived at Khartum, accompanied by Lieut. Bentley and his wife on their D.H. Moth.

SIR ALAN COBHAM'S PROGRESS.

On March 30 Sir Alan Cobham, Lady Cobham, Mr. Worrall, mechanic and photographer, who are making a survey flight round Africa on the Short Singapore (two 650 h.p. Rolls-Royce Condor engines), alighted in Simons Bay, near Cape Town, thus completing the outward portion of the journey.

On going ashore they were met by the Mayor and Corporation of Simonstown, after which they motored to Cape Town, where they were entertained at lunch in the City Hall.

MR. HINKLER IN AUSTRALIA.

On March 30 Mr. Bert Hinkler left Melbourne for Perth, W.A., on his Avro Avian (A.D.C. Cirrus II engine), where he will meet his wife on her arrival from England. He will then return to Melbourne, carrying his wife as passenger, calling at Adelaide en route.

THE "RED ROSE" IN AUSTRALIA.

On March 31 Mr. W. N. Lancaster and Mrs. Keith Miller, who have flown from England to Australia in an Avro Avian, arrived at Sydney, escorted by 20 aeroplanes. They were officially greeted by the Acting-Premier of the State. Later they will go to Canberra, where Mr. Bruce has arranged a special welcome for them.

THE FRENCH TRANS-ATLANTIC ATTEMPTS.

For the Trans-Atlantic season, which in about two months' time will be in full swing, France has five serious projects for flights from Paris to New York.

The Breguet Company is preparing two "type Grand Raid" Breguet XIX biplanes, one fitted with a 500 h.p. Hispano-Suiza engine and the other with a new type Lorraine-Dietrich engine. The former will be flown by M. Costes and the latter by Lieut. Challes.

The Bleriot Company is preparing a Bleriot biplane, fitted with four Hispano-Suiza engines, which will be flown by M. Bossoutrot.

The fourth project concerned a three-Hispano-Suiza-engined thick-wing monoplane, designed by M. Couzinet, which is being built by the Letord Company. Th machine, which is due for test in about three weeks' tin will be flown by M. Drouhin.

Finally, the French Navy has on order a twin-engin high-seas flying-boat from the Latham Company with wh it is proposed to fly in three stages from France to t United States. This machine will be flown by Lieut. Vaisseau Guilbaud, and the route to be followed will b Brest—the Azores (2,080 kms.); the Azores—Bermuda (3, kms.); and Bermuda—New York (1,230 kms.).

THE IDEAL AIR PORT.

The Council of the Royal Institute of British Archite have accepted an offer from the directors of the Gloster A craft Company and H. H. Martyn and Company Limited, give a prize for the best imaginative scheme for a Lond aircraft terminus suitable for the supposed requirements air traffic 15 years hence.

The general object of the competition is to stimulate imagination and foresight of architectural students and assist them to visualise the influence which aerial devel ment must have on the design of a first-class aerial termi with every accommodation for personnel and machines a with every equipment and comfort for passengers. T terminus is to be for landplanes and amphibians, it be assumed that seaplanes and airships will have separ termini. The jury formed to award the prizes consists of Sefton Brancker (Director of Civil Aviation), Mr. C. Cowl Voysey, Mr. E. Vincent Harris, Sir Edwin Lutyens, Ma R. H. Mayo, Mr. T. S. Tait, Mr. Maurice E. Webb, a Mr. G. E. Woods-Humphery.

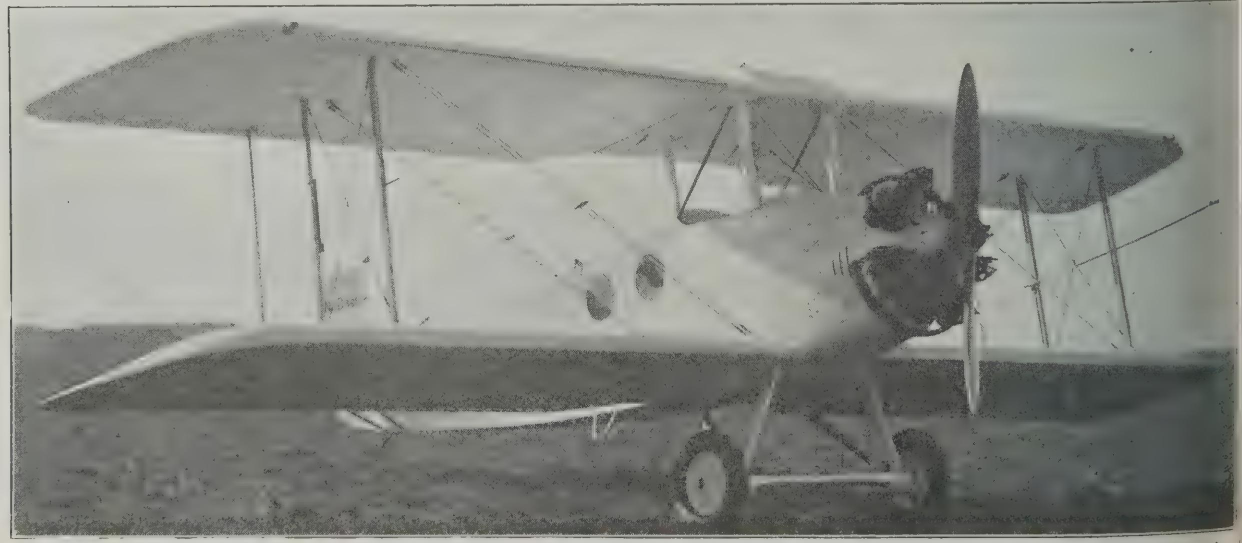
The first prize will be £125 and the second prize £25, a the competition is open to bona-fide students of architect who are associates, elected students, or registered pro tioners of the R.I.B.A., and who are below the age of years on Sept. 1, 1928. Full details of the competition, wh is to be conducted in two stages and closes on Jan. 10, 1 can be obtained from the offices of the Institute, 9, Cond Street, Hanover Square, London.

FAIRCHILD PROGRESS.

Nothing succeeds like success. Everybody in this coun has heard of the Fairchild Camera and probably of the F child Air Survey outfits, but Fairchild aircraft are not well known. So there is considerable interest in not that between June 1, 1927, and Jan. 31, 1928, the Fairch Airplane Manufacturing Corp. has made and sold 56 purpose cabin monoplanes. Considering how many ot manufacturers of civil aeroplanes there are in the Sta making cabin monoplanes with 200 h.p. Wright Whirlwi on approximately similar lines the figures are remarkabl

That is only one firm in the American Aircraft Indus though admittedly one of the best. How many Bri manufacturers have delivered 56 aeroplanes of any ki civil or warlike, in eight months?—always excepting ubiquitous De Havilland Moth.

Still, there is always room on top, and as the Fairch Corporation itself says in its advertisement: "If a r make a better mousetrap than his neighbor the world beat a pathway to his door." Truly, in these days of fie competition, success is not a matter of luck, but of values.



THE LYNX ABROAD.—A Nieuport-Delage light transport biplane (230 h.p. Armstrong-Siddeley Lynx engine) which has been supplied to the Compagnie Aérienne Française.

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AERONAUTICS IN CHINA.

China is perhaps the most wonderful of the eastern countries of the world from the point of view of scope for the development of Aviation and Aerial Transport, but at the present time to attempt to do anything but to sell a few aeroplanes to one or two of the warring factions is absolutely hopeless, and probably will be for some years to come.

There can be little doubt that when a stable government does emerge from the present chaos, those foreign firms who are actually organised on the spot will be the ones who will do the business and in all probability reap a rich harvest, though it is a debatable point as to whether the business in aircraft which is then sure to accrue, will be worth any business man's while to wait for, for what may well be an indefinite period.

At the present time the only one of the many War Lords who has anything approaching an Air Force as we understand it is Marshal Chang Tso Lin. It is commanded by his son, Marshal Chang Hsiao Liang, who, to all intents and purposes, also commands all the other arms of his military organisation, with the result that although he is quite keen on his "newest toy," he has not the time to make a really first-class job of it.

Of course, as most readers well know, there have been aeroplanes in China for some years, and Chang Tso Lin has always led the way on the military side, while the Central Government (now under his control) has been quite enthusiastic at one time or another about flying in that country. Unfortunately of late however even the rather go-a-head Marshal has somewhat tired of aerial warfare since his pilots have never been able to show him what aircraft can really do.

The Chinese are not keen on aviation for aviation's sake but simply because, as at present used in that country, it is a soft job which often leads the way to a staff appointment not only in the flying service but in some entirely different arm of the service or on the personal Staff of one of the many generals.

There can be no doubt that if some foreigner could show them how great an influence, if not a determining factor aircraft can be in a military campaign, the Chinese would readily concentrate more time and money on this new arm. Which would of course appreciably help to further commercial aviation in that country when the time arrives. But for a foreigner to try and do this now, is as good as hopeless.

The idea of a foreign Advisor to the Chinese is a grand one as the more advisors any general has got, the more "face" does he gain with his other generals and even with his opponents. In the case of Marshal Chang Hsiao Liang he is prepared to pay one reasonably well, but as to taking the advice of his advisor it is quite a different matter.

To start with it is very difficult to see him, and when he has given his sanction to any re-organisation the number of difficulties which his subordinates will put in one's way quite uncanny. You will find that in the mornings your will not arrive to take you to the aerodrome (in the c of Peking it is 10 miles away), and if it does arrive an h late it is nothing. If on the other hand it does not co at all, a far more likely instance, a perfectly wonde array of excuses will be proffered the following day whenever you may be fool enough to telephone the Offi in charge of transport and ask why you have got up 3.30 or 4 a.m. all in vain.

Apart from the usual hackneyed excuses of dud spark plugs, burst tyres, etc., you will from time to time be t that General So-and-So had the car out late the night bef and the driver was too tired to get up so early, or that lighting set will not work so the car must stay in unti is done. Which takes anything from a week unless stand and see it done for yourself, and not to mentio hundred and one other futile and untrue yarns.

For all this trouble you will probably receive a m humble apology. But it means absolutely nothing and only another way of stopping you making too many a ward inquiries.

The probable fact of the whole matter is that one of transport officers, or possibly a young general, wanted take one of his pet concubines out to dinner "and sp the evening."

Finally when you do get a fair run of luck and can get to the aerodrome for a few days in succession, you will met with a hundred excellent reasons as to why the hang should on no account be cleaned, why the machines much better when they are inches thick in dust, or engines will run much better if they have sand in them one magneto instead of two. And so it goes on, and return to your hotel feeling that things are not any cheerful.

The machines at present in use in China consist chiefl French Breguets and Caudrons, also about a dozen Fre amphibians, some Vickers Vimys (which, although they sadly neglected and about eight years old, do most of work), an assortment of Fokkers, Hanriots, and some old Avros. Few of the machines are fit to leave the gro at all, and no pilot who valued his life would fly any them.

At Mukden, the Headquarters, there are thousands pounds-worth of spare parts, but to get a spare part from there to the aerodrome at Peking will probably anything from a month to two months, although the jou by rail can be done in 23 hours. It is hard to conjec why this is, but the fact remains that it is the Chinese of doing things!

What use the Chinese make of aircraft at present best be illustrated by the following little story :—At the of last year a fresh war was started when Chang Tso Lin attacked by Yen Shi Han, the Governor of the Provinc Shansi, and the declaration of war rather took him unaw

THE BRIGHTER AERODROME MOVEMENT.—A Schreck-F.B.A. amphibian (180 h.p. Hispano-Suiza engine belonging to the Chinese Naval authorities on the beach at Tsingtau, North China.

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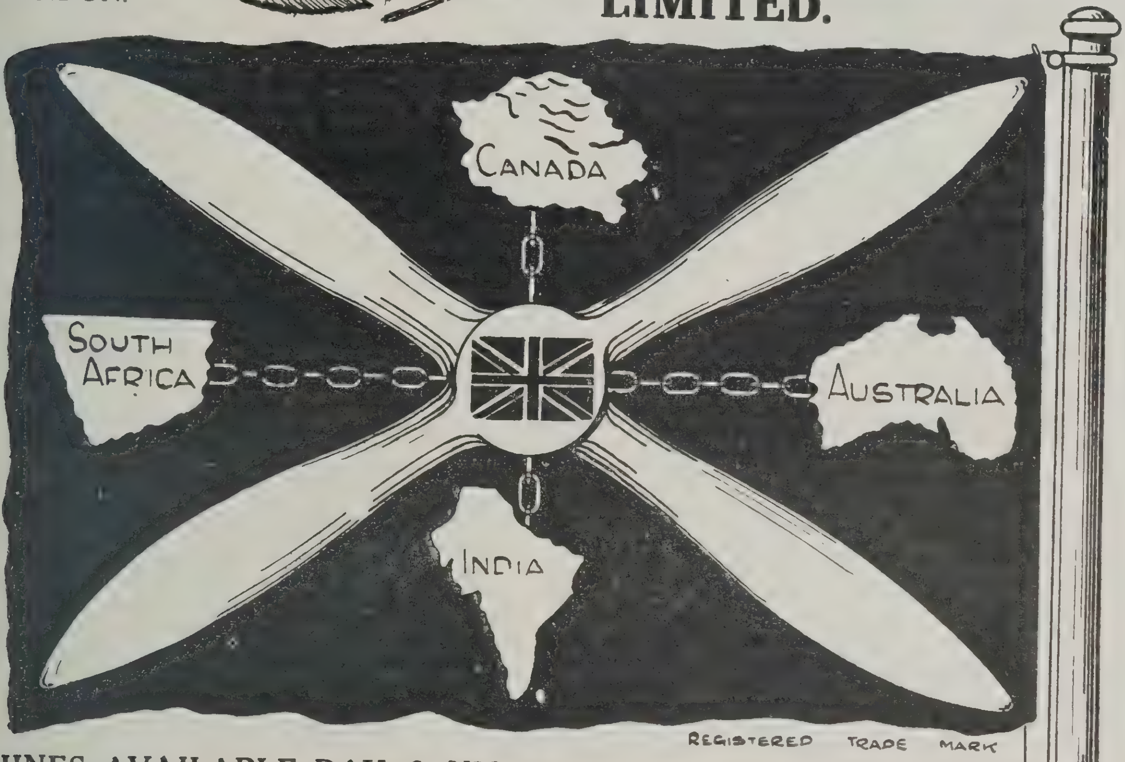

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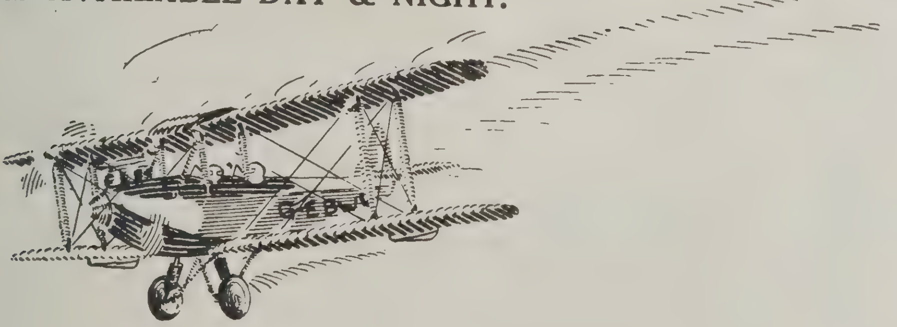

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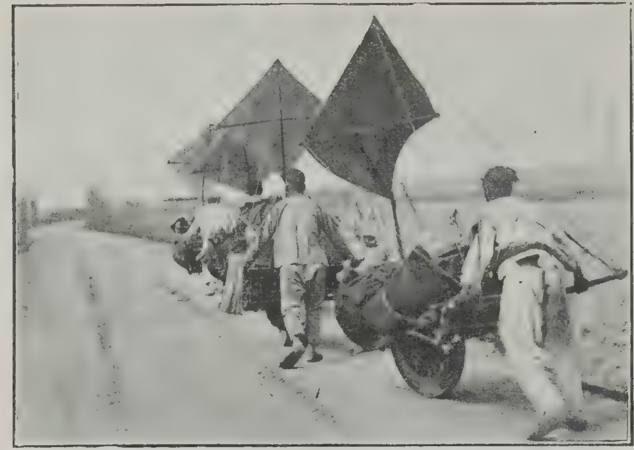

CHINESE AVIATION.—How the Chinese coolie uses Air Power.

We were ordered to Paotingfu, the Headquarters of his forces, where there is a reasonably good aerodrome. The squadron consisted of two Vickers Vimys, three Breguets, a couple of Caudrons and an Ansaldo. There were ample pilots for each machine to have three apiece and seven or eight of these pilots could fly the Vimys quite well.

I at once suggested that bomb raids should be carried out in formation all day long on the enemy's railhead (a distance away by air of about twenty minutes), and that these should be kept going by changing pilots in relays. What actually happened was that once a day the two Vimys dropped two 150-lbs. bombs, and to do this it was considered necessary to carry two pilots and two mechanics each (the latter to drop the two bombs). The machines flew at over 6,000 feet and on two occasions very skilfully unloaded their bombs on their own troops. One of the Breguets, which was piloted by a Russian, made a sort of reconnaissance once a day from 8,000 feet, and the other machines were never used as "they had to be kept in reserve."

It was at this point that I severed my connection with the young Marshal, who, entirely contrary to my agreement, wired me to drop bombs and do other military work. After we had been at Paotingfu for about four days, I received a written order to carry out a bombing expedition and reconnaissance, and this I refused to do. I was immediately placed under arrest and confronted with a firing party. I told Marshal Chang to shoot me if he dared.—He did not have me shot, though I was kept a prisoner in Paotingfu for 23 days, and when I finally did get back to Peking received no pay for the previous month.

It was none too pleasant an experience, but all the same quite interesting, and I found that you can get a thrill from a firing party!!! But ..... I shouldn't advise anyone else to try it!—H. M. Talbot-Lehmann.

A GOOD OMEN.

When influential or popular papers outside of our own little circle begin to take a serious interest in flying, not only is the effect good from our own point of view but there is clear indication that the Nation is becoming more air-minded. Consequently readers of The Aeroplane will welcome the production by that popular paper, *The Bystander*, of a Special Aviation Number on April 18.

This number will include a foreword by Sir Sefton Brancker, an article by Capt. Geoffrey de Havilland on "The £ s. d. of Flying," from the point of view of the upkeep of an aeroplane by a private owner, and an article on "Aviation for Women" by the Honourable Lady Bailey. Also there will be an appeal for municipal landing grounds—one hopes he will call them Air Parks—by Capt. Charles E. Ward.

A very useful item in the paper will be a list of flying clubs, a complete list of existing landing grounds and a list of the flying events for the year 1928. One understands that this list can be obtained, mounted on stiff card suitab for hanging in Clubs, etc., on application to *The Bystande* This chart alone should be worth the shilling which is bei asked for the whole number.

AN EDUCATIVE EFFORT.

Responsible persons such as members of Air Force Unit Civil Servants, agents for aircraft anywhere in the World, ar presumably, schoolmasters and school libraries, can have f the asking a handsome publication just produced by Handl Page Ltd., of Cricklewood, London, N.W.2, entitled *The Ev lution of the Aeroplane*. In this publication the firm has s forth interestingly and attractively much of its early histo and its development up to the present day.

Though the firm itself was not formed till 1909, M Frederick Handley Page himself, then an electrical engine of unusual promise, became interested in flying in 1906. T book is excellently illustrated, and those who remember t very early days of flying will be glad to see pictures of t famous "Antiseptic" and "Yellow Peril" which we familiar to them in the dark ages of aviation. Incidental those early pictures show that so far away as that M Handley Page was already concerning himself particular with the problems of stability which the slotted wing has last solved.

Those whose thoughts run on big aeroplanes will be equal interested to see a picture of the original 0/100, which rightly claimed to be the father of all large aeroplanes, f from it evolved the 0/400 which was so largely used as night-bomber during the War 1914-18. Thanks to Commodo Murray Sueter and Wing Cdr. Randall, as they then were, t Aircraft Industry was encouraged to produce new and i proved aircraft at a time when the R.F.C. was endeavouri to standardise everything, and the ultimate development big aeroplanes is shown in the Handley Page V/1500, whi was the largest four-engined machine built during the la War, and is still worthy to compare in size and performan with our modern giant aircraft.

In the portion of the narrative which concerns the War the are several quite good stories and some statements whi may be healthily provocative of argument.

The section of the book which is concerned with Ci Aviation is certainly not less interesting than the war-ti section, and of course due attention is given to the slott wing. One must say that it is a pity there is no diagram the theory of the slotted wing.

Anybody who can get hold of a copy is bound to be int ested in it, but one particularly commends it to the attenti of those who are charged with the education of the you

C. G.

AN AMUSING FRAUD.

The alleged invention of a new type of fuel-less aero-engi employing electro-magnetism in connection with the rota motion of the earth, has achieved a certain amount of p licity in the daily press. The modest inventor, Mr. Lester Hendershot, is reported to have stated that his principle in no sense connected with perpetual motion, although te have shown that it would run indefinitely.

On Feb. 24 the inventor demonstrated the contraption Selfridge Field, Mich., in the presence of Major Lanphi A.C., Commanding Officer at Selfridge Field, and Col. Char Lindbergh. It was announced at this demonstration t the bag of tricks turned at 1,800 r.p.m., and that it wo run for between 20,000 and 30,000 hours before it was nec sary to recharge the magnet centre, all of which was d swallowed by the press reporters.

It is now understood that the demonstration was a fra and that concealed beneath the "test bed" were a f batteries, accumulators and other energising agencies.

The names of Major Lanphier and Colonel Lindbergh w used in order to sell stock to the gullible public, but bef much headway had been made somebody in New York du cated the phenomenon with a similar machine, this ti being careful to show all the works underneath.

The Army Authorities have ordered an inquiry to expl why such a demonstration should have been permitted on Army station.

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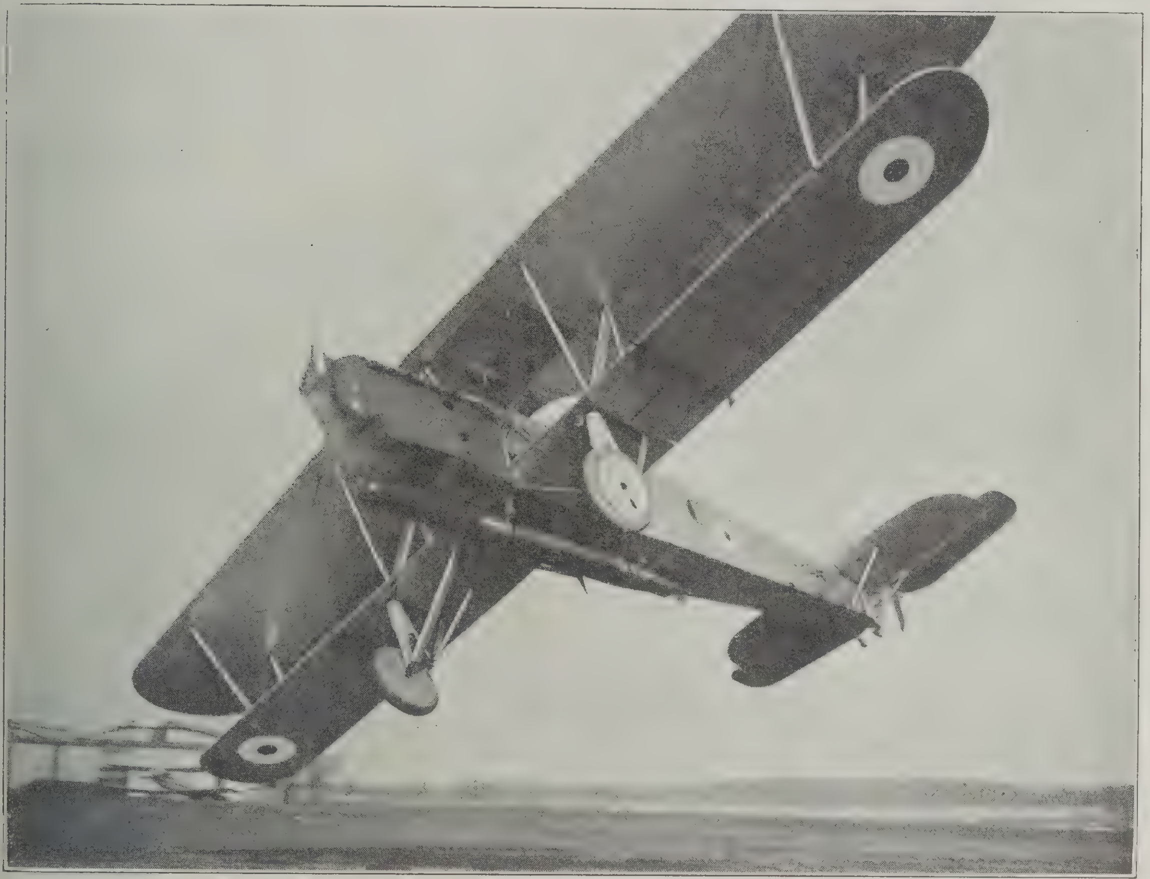

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THE FLYING CLUBS.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending Mar. 31.

Flying Time 24 hr. 45 min. *Instruction* 12 hr. 15 min. *Solo Flights* 8 hr. *Passenger Flights* 3 hr. *Tests* 1 hr. 30 min. *Instruction.—With Mr. Baker*—Messrs. Chart, Heath, Weale, Benson, Goss, Miss Hill, Messrs. Sterm, Mills, Johnson, Mills, Harrison, Riley, Faulkner, Tweedale, Garner, Mason, Fallon, Brooking, Slack, Greenhalgh, Caldecott, Cohen, Taylor, Hartley, Mangnall, Hardy, Secker, Pattreioux, Stross. *Soloists (under instruction)*.—Messrs. Hall, Browning, Sterm, Ruddy, Tweedale, Brooking, Cohen. *Pilots.*—Messrs. Lacayo, Heath, Caldecott, Crosthwaite, Leeming, Davison, Twemlow, Meads, Michelson, Goodfellow, Hardy, Gattrill, Cantrill. Fourteen passengers were given joy-rides.

Notes.—Mr. Tweedale made an excellent first solo. The aerodrome will be closed on Good Friday and Easter Saturday.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Mar. 31.

Flying Time 33 hr. 35 min. *Dual* 7 hr. 35 min. *Solo* 10 hr. 45 min. *"A"* 11 hr. 10 min. *Passengers* 2 hr. 35 min. *Tests* 1 hr. 30 min. *Instruction.—With Mr. Parkinson*—Messrs. Maxwell, Brooks, Runciman, Lloyd-Browne, Horn, Percy, Cochrane-Carr, Griffiths, De Pledge. *Soloists.*—Messrs. Maxwell, Runciman, Brooks, Horn, de Pledge, Percy. *"A" Pilots.*—Mrs. Heslop, Miss Leathart, Messrs. D. Wilson, R. N. Thompson, J. E. Glenny, C. Thompson, H. Ellis, C. E. Shaw, Dr. H. B. L. Dixon, Mr. A. Bell. Five passengers were given joy-rides.

Notes.—Slight breaks in the clouds enabled Mr. W. L. Runciman, Mr. A. Maxwell and Mr. G. E. Brookes to be launched solo, all of whom made excellent first flights and landings.

Further clear periods allowed the following members to make their height tests, all in a very satisfactory manner indeed, Mr. J. P. de Pledge, Mr. Lloyd-Browne, Mr J. T. Percy and Mr. G. E. Brooks.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, Yorks.]

Report for week ending Mar. 31.

Flying Time 16 hr. 15 min. *Instruction* 6 hr. 45 min. *Soloists* 8 hr. 15 min. *Passengers* 35 min. *Tests* 40 min. *Instruction.—With Mr. Beck*, 13. *Soloists*, 5. *"A" Pilots*, 4. *Passengers*, 5.

Notes.—A more or less uneventful week with the exception that on last Tuesday Mr. Geoffrey Ambler did his first Solo and put up a very creditable show.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Mar. 31.

Flying Time 11 hr. 40 min. *Dual Instruction* 6 hr. 55 min. *"A" Pilots* 2 hr. 30 min. *Solo* 1 hr. *Passenger Flights* 55 min. *Tests* 20 min.

Notes.—The Club will be open at Easter, but will be closed on Monday and Tuesday, Apr. 16 and 17.

The Suffolk Aeroplane Club.

[Hon. Sec.: Courtney N. Prentice, Hazeldell, Stowmarket.]

Report for week ending Mar. 31.

Flying Time 10 hr. 5 min. *Instruction.—With Mr. Lowdell*—Miss G. Rhodes, Dr. Dunn. *Soloists.*—Dr. Jas. Sleigh, Mr. R. Brown, Mr. C. N. Prentice, Mr. S. Schofield. Passengers two.

THE "ON TO HADLEIGH" RALLY.

All aircraft arriving at Hadleigh aerodrome on the morning of Easter Sunday, Apr. 8, for the purpose of taking part in the Air Display on Easter Sunday and Monday, organised by the Suffolk Aeroplane Club, will be regarded as competing in the "On to Hadleigh" Rally.

This must not be regarded as an Air Race in the true sense of the word, but rather the prizes—£10 first, £7 10s. second, and £5 third—must be regarded as a bonus given by the Club to competitors in return for their assistance at the Display, while at the same time it will add a certain element of sport to the arrival of visiting aircraft.

All pilots flying from Lympne and East Kent are to fly to Hadleig *via* Sutton Farm Aerodrome, Nr. Hornchurch, Essex. They are to fl over Sutton Farm Aerodrome at a height of not more than 100 fe so that the Official Observer can note registration marks. This cours has been adopted to avoid crossing the mouth of the Thames.

Pilots who have been at Lympne on Good Friday and Saturday f the Cinque Ports Meeting are invited to make a race between themselves, while competing in the general Rally.

The prizes will be awarded to the pilots who obtain the highe number of marks based on a simple handicap formula, which tak the distance flown in a straight line from a named point of d parture to Hadleigh as a basis.

Zero hour will be 11.30 a.m. The distance in miles flown will b divided by the number of minutes before or after zero hour th pilots cross the finishing line on the aerodrome in flight. The resu of this calculation will be the marks obtained by each pilot. two pilots tie, the one who has made the longest flight will be th winner. In the event of a dead heat by two pilots who have cover an equal distance, first and second, or second and third, prizes wi be divided as the case may be.

The finishing line at Hadleigh is a track across the aerodron running North and South; machines arriving are to cross this fro West to East.

Any pilot observed to be cruising about in the vicinity of the aer drome will be disqualified.

Entries stating points of departure, registration mark of machi and the intention to take part in the Display on Easter Sund and Monday should be forwarded as early as possible so as to rea the Hon. Secretary of the Suffolk Aeroplane Club not later than Apr.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending Apr. 1.

Total Flying Time 18 hr. 20 min. *Instruction.—With Mr. Fry* Messrs. E. Varden Smith, A. G Lofty, C. Browne, E. Lambert, Bougret, G. Barker. *Soloists.*—Messrs. E. Varden Smith, G. Bark W. P. Cubitt, F. Gough, R. T. Harmer, H. Pank, R. F. Potter, N. Bre G. Surtees, W. A. Ramsay, C. Gowing, H. Mack, R. W. Moore. Twel passengers were given joy-rides.

Notes.—Mr. E. Varden Smith and Mr. A. G. Lofty made their fi solo this week and we now have seven waiting for their "A" Licenc

The membership of the Club has now reached 268 and several n flying members have taken up instruction

Master Victor Moore, aged 8 years, climbed into the Moth on Sund and promptly sank down out of sight in the front cockpit; he sa he thoroughly enjoyed his trip when he came down.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Mar. 31.

Flying Time 16 hr. 25 min. *Dual Instruction* 8 hr. 15 min. *So* 6 hr. 30 min. *Passengers* 1 hr. 40 min. *Instruction.—With Mr. Bartlet* Messrs. Roberts, Tanner, T. H. Clarke, Girdlestone, Hughes, Kenna Lysaght, Bathurst, and Miss Huggett. *Soloists.*—Messrs. T. H. Clar and Arnold. *"A" Pilots.*—Messrs. Downes-Shaw, Hopper and H. C. Bathurst. Four passengers were given joy-rides.

Notes.—The weather has been against any lengthy flying this wee Mr. Bartlett went to the Isle of Wight and back, but otherwise the is little to report.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending Mar. 31.

Flying Time 4 hr. *Dual Instruction* 1 hr. 30 min. *Solo* 1 *Passengers* 1 hr. 30 min.

Notes.—The weather, with high wind and rain nearly every day, responsible for our poor report this week.

Two new members have joined this week.

The Edinburgh Aero Club.

[Hon. Sec.: T. J. Connolly, 20, Leith Walk, Leith.]

Report for month ending Mar. 31.

The month of March has been taken up with necessary preliminar to the Club being put on a working basis.

JUST OFF.—An Avro Avian (A.D.C. Cirrus II engine), the price of which has just been reduced to £600 complete with standard equipment.

Accommodation is definitely assured the Club at Turnhouse Aero-ome, and it is expected that the Club will be formally installed there ring April.

Nearly 100 persons have intimated their desire to become members the Club, either as pilots, observers or associates.

Some days ago a member of the Committee, Mr. L. C. Davey, who also a member of the Scottish Flying Club, flew from Moorpark rodrome to Turnhouse Aerodrome and back—giving a number of monstration flights when he was in the Edinburgh district.

The Club is making every endeavour to secure a machine or machines ring April, so that the instruction of members may begin either April or in the beginning of May.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending Apr. 1.

otal Flying Time 103 hr. 20 min *Instruction.—(Dual)* 36 hr. 50 min.; *lo)* 58 hr. 0 min. *Other Flying* 7 hr. 50 min.

Notes.—March has proved to be a record month for the school, the al flying reaching the high level of 304 hr. 30 min., made up of hr. 15 min. dual and 184 hr. 15 min. solo instruction.

During the past week two "ab initio" pupils made first solos, and ee other pupils successfully passed the various tests necessary for ir "B" Licences.

Two new Moths were tested and experiments with the slotted wings a Moth machine have been continued.

The D.H. Hound has also undergone various tests during the week.

The Henderson Flying School.

Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending Mar. 29.

otal Flying Time 29 hr. 40 min. *Dual* 24 hr. *Solo* 5 hr. 25 min. *al.—With Mr. H. D. Davis*—Messrs. Hamilton, Hughes, Worley, iao, Daniels, Mills, Whitard, Habsburg, Whitley. *With Mr. A. E. lds*—Messrs. Van Gessel, Hughes, Hsiao, and Dr. Forcyth. *Solo.*—ssrs. Habsburg, Whitley, Liniker, Crabtree, Patton, Bethune, derson.

otes.—The dual time is well up this week owing to the arrival several new pupils.

Messrs. Worley and Whitard are taking it in turn for early morn- flying and the dual machine is well away by 7.15 a.m.

he Spring term has now begun and the firm has at the moment three vacant rooms for new pupils.

he total number of qualified pilots turned out since the New Year v number seven and several more are about nearly to take their s.

THE DUKINFIELD ACCIDENT.

he inquest on the seven-year-old boy, Jack Hood, who was killed Mar. 22 at Dukinfield by an aeroplane, which after landing in a d ran into a wall near which were a number of spectators, was d at Dukinfield on Mar. 28-29 The following report of the pro-dings is taken from *The Times*:—

he first day's proceedings were limited to the taking of evidence of identification and medical evidence so that the funeral could proceed.

On the resumption of the inquest on Mar. 29, the Coroner heard the evidence of the occupants of the machine, Miss Brown and Mr. Browning.

Walter Samuel Browning, a film salesman, of Rusholme, said that he was a flying member of the Lancashire Aero Club, and held a flying certificate from the Air Ministry. It was decided to deliver a film to a Stalybridge cinema on a Sunday because a crowd could collect. He visited the landing field, and thought it was suitable. Describing the landing, Browning said that he saw about 2,000 people in the field below. Miss Brown attempted to land, but was too high, and decided to make another attempt.

Browning at this point said there was nothing in the box, the sole object being to secure publicity for the film.

The Coroner: You were deluding the public?—Yes; we did not consider it safe to carry a celluloid film in an aeroplane.

Browning said that the machine alighted, but it did not lose speed, and he realised that Miss Brown was trying to get out of the field. She had not been told that the field was surrounded by walls, and, he added, "she knew nothing of the 'stunt.'" He had nothing but praise for the manner in which she landed. People surged forward, and Miss Brown did the correct thing in trying to rise over their heads. He was in the front seat of the aeroplane.

Asked by the Coroner what qualification he had for selecting the landing ground, Browning replied, "None, except that I am a pilot."

Several witnesses gave evidence that the aeroplane propellor struck the boy on the head.

Miss Winifred Sawley Brown, living at Broughton Park, Manchester, said she did not know the flight was "an advertising job."

The Coroner: You did not know you were being hoaxed into taking part in an advertising scheme?

Miss Brown: No, I had no idea.

She added that she had gone to Woodford aerodrome for tea and while there was asked to take Mr. Browning on an urgent journey.

She was surprised when over the landing field to see the people below. She asked Browning to correct her telephone so that she could speak to him, but he said that there was not time. She thought she was going to land in the country. She never doubted Mr. Browning's assurance that the field was suitable for landing. It was impossible for her to judge from the aeroplane. On reaching the ground she realised that the machine would not pull up before running into the crowd. She took the only possible course and tried to take off again, but the machine struck the wall.

The Coroner, who sat until a late hour, addressing the jury, said that they could exonerate Miss Brown from any participation in the advertising scheme, for she was told a deliberate lie—that the journey had to be urgently made—whereas there was no film in the box. It was difficult to understand what qualifications Mr. Browning had to choose the ground. His flying experience was merely that of a novice.

The verdict was "Death by misadventure," and the jury exonerated Miss Brown from all blame. They recommended that the Air Ministry should take steps to ascertain that all grounds intended to be used for the landing of aeroplanes in public should be safe and suitable.

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THE JUNKERS G.31.

The G.31 is an enlarged and improved version of the well-known Junkers G.24, fitted with three Jupiter engines of 420 h.p. and so equipped that it may be used for long-distance and night passenger carrying.

Like all the Junkers machines it is a low-wing cantilever monoplane, framed and covered in duralumin.

The fuselage is of uniform rectangular section over 7.5 m. (25 ft.) of its length, and is here 2.1 metres wide by 2.6 m. high (6 ft. 10 in. × 8 ft. 6 in.). The structure of the central wing section is built into the fuselage, and the cabin floor in the fuselage is entirely above this wing structure. This leaves the cabin 1.85 metres (6 ft.) high and allows a depth of 0.6 metres (2 ft. about) below the floor for goods and luggage.

The cabin proper is divided into three compartments by bulkheads (through which however a central gangway passes) and in each compartment are four seats, in pairs, facing each other, giving ample room for a table between seats. Alternatively each compartment may be fitted with four sleeping banks, in pairs, one above the other, on each side of the gangway.

For cases where more seating is needed, there is ample room for an extra pair of seats in each compartment, and by putting in a pair of extra seats in odd corners twenty passengers may easily be carried.

The interior of the cabin is not only roomy but exceedingly comfortably, and even lavishly, fitted. To English eyes used to signs of a close attention to weight-paring, it looks as though a good deal of unnecessary weight was being carried, but for long distance services passengers must be made comfortable, and German designers have recognised this.

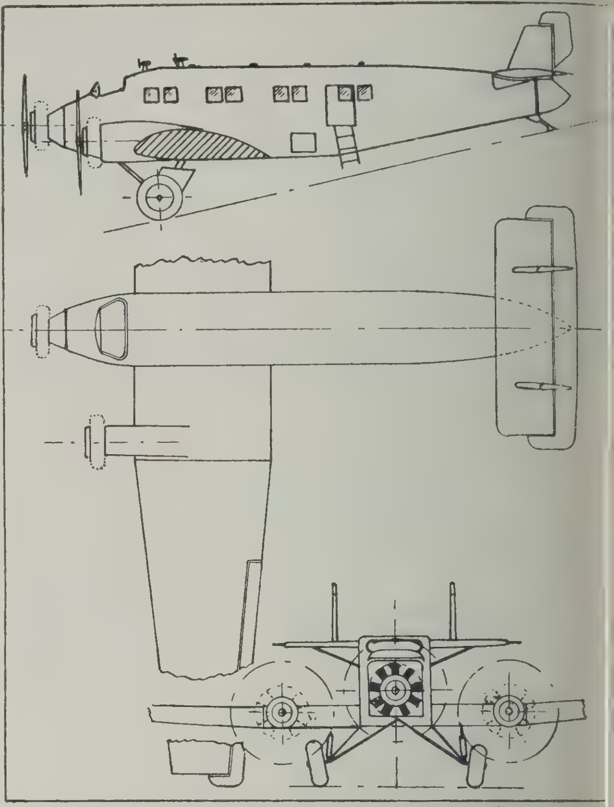
Ahead of the cabin is a wireless room, and a compartment containing a Bristol gas-starter. There is also a roomy front baggage space. Then comes the pilot's cockpit, seating two pilots side-by-side, which is relatively as roomy as is the cabin. In the machine which recently visited Croydon this cockpit is entirely enclosed by the wind screen.

The whole of the control leads to the tail are carried in an easily accessible triangular duct below the floor of the gangway through the cabin. Behind the cabin there are a pair of walkways running up the tail of the body, so that the controls may easily be reached at any time. Further to facilitate inspection of the interior of the aft end of the body, the tail end of the fuselage, below the tail is merely a fairing piece hinged to the frame and readily openable.

In construction standard Junkers practice is followed throughout. The fuselage is built on a number of channel-section duralumin frames, with only very light longitudinal members, the corrugated duralumin skin taking the main stresses.

The wings are built on a number of duralumin tubes running along the span and arranged round the periphery of the wing section. These are tied together by diagonal tube bracing running both fore and aft and transversely, and the whole is covered with corrugated duralumin.

The nose engine is mounted directly on the fuselage. The two wing engines are carried on nacelles built onto the outer ends of the central wing section, and are well ahead of the leading edge. The outer sections of the wing are attached to the central structure just outside the engines.



The undercarriage consists of two axles, hinged to th centre line of the bottom of the fuselage, each supported a telescopic leg running up to the wing inside the wing e gines. Each axle and telescopic strut is held forward by strut running forward and up to the lower corner of th fuselage.

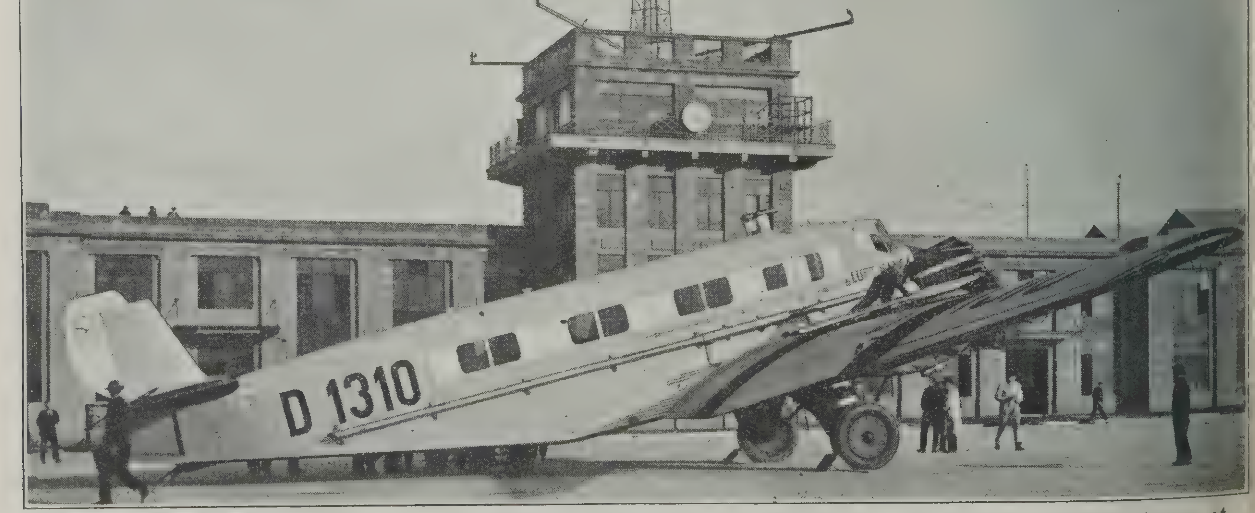
The tail plane is mounted above the fuselage and is str braced on the under side. A single elevator, with hor balances at each end, runs right across the tail. Two fi each with a balanced rudder, are carried above the t plane.

SPECIFICATION.

DIMENSIONS.—Span 30.3 m. (99 ft. 6 in.), Length 16.5 (54 ft. 2 in.), Height 6.2 m. (20 ft. 4 in.), Wing area 9 sq. m. (1,040 sq. ft.).

WEIGHTS AND LOADINGS.—Weight empty 4,970 kg. (10,9 lbs.), Weight loaded 8,000 kg. (17,600 lbs.), Wing loadi 84.5 kg./sq. m. (17.4 lbs./sq. ft.), Fuel and oil (1,8 litres) 1,480 kg. (3,260 lbs.), Power loading (1,350 h. 5.9 kg./h.p.

PERFORMANCE.—Max. speed 200 km.h. (124 m.p.h.), Landi speed 113 km.h. (70 m.p.h.), Climb to 2,000 m. (6,5 ft.) 15 mins. Range 7 hours at 170 km.h. (105 m.p. =1,200 km. (740 miles).



AN INTERESTING VISITOR.—The Junkers G-31 (three Jupiter engines) in front of the control tower at Croydon.

REYNOLDS
AIRCRAFT TUBING

is used exclusively
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most popular R.A.F. "Fighters"
and also
in the Construction of the most Popular
Light 'Plane of to-day,

Two of the many testimonies of Quality and Reliability.

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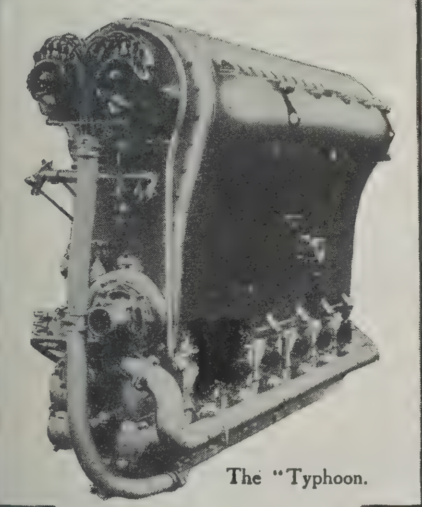
'Typhoon' and 'Cyclone' AERO ENGINES



The "Typhoon.

950 B.H.P. (Six-Cylinder Direct Drive) 1,350 R.P.M.

LOW PETROL CONSUMPTION, .48 lbs. per B.H.P. Hour.

LOW OIL CONSUMPTION, .01 lbs. per B.H.P. Hour.

The Beardmore "Cyclone" Aero Engine marks a distinct forward step in design. The combination of direct drive and low head resistance and slow moving propeller makes for great aero-dynamic efficiency. Simplicity in design ensures low maintenance costs.

Enquiries may be directed for convenience to Aero Engine Depot, William Beardmore & Co., Ltd., 36, Victoria St., S.W.1.

WILLIAM
BEARDMORE
AND COMPANY LIMITED
PARKHEAD. GLASGOW.

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 6; Monday, 22; Tuesday, 21; Wednesday, 21; Thursday, 14; Friday, 15; Saturday, 20.

IMPERIAL AIRWAYS LTD.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 48, passengers 379, freight 15 tons.

AIR UNION:
Paris—London: Machines 32, passengers 131, freight 13½ tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 12, passengers 48, freight 3½ tons.

SABENA:
Brussels—London: Machines 12, passengers 11, freight 1 ton.

DEUTSCHE LUFTHANSA AG.:
Amsterdam—London: Machines 13, passengers 27.

PRIVATE:
Machines 2, passengers 0.

Total number of trips by British Machines, 50, carrying 379 passengers. Foreign Machines, 69, carrying 217 passengers.

COMPARATIVE FIGURES.

Week ending Mar. 31:
Machines, 119; Passengers, 596; Crews, 226; Total personnel, 822.

Corresponding week, 1927:
Machines, 79; Passengers, 322; Crews, 125; Total personnel, 447.

Corresponding week, 1926:
Machines, 98; Passengers, 516; Crews, 125; Total personnel, 641.

Corresponding week, 1925:
Machines, 92; Passengers, 344; Crews, 116; Total personnel, 460.

Corresponding week, 1924:
Machines, 44; Passengers, 179; Crews, 76; Total personnel, 255

Corresponding week, 1923:
Machines, 93; Passengers, 417; Crews, 156; Total personnel, 573.

Corresponding week, 1922:
Machines, 60; Passengers, 137; Crews, 100; Total personnel, 237.

Corresponding week, 1921:
Machines, 58; Passengers, 210; Crews, 78; Total personnel, 288.

Corresponding week, 1920:
Machines, 36; Passengers, 45; Crews, 40; Total personnel, 85.

Croydon Notes.

Imperial Airways' special trips for the Grand National on Friday and for the Boat Race on Saturday were both remarkably well patronised. Five machines carried forty-four passengers to and from Aintree for the Grand National, and three machines took forty passengers to see the Boat Race. If these figures are added to those given in the table of Continental traffic it will be seen that just about 460 passengers were carried by the British Air Line during the week.

Even apart from these specials, the traffic in passengers is well above the record of any previous week at this period of the year, beating even last year's Easter week. Both Imperial Airways and Air Union are finding the demand for seats on the London—Paris route is larger than they can conveniently handle at the moment, and have frequently to refuse applications for seats.

The new control tower is still not in service. Some curious trouble—said to be the result of mounting the direction-finding gear high above the ground—has been found in getting accurate wireless bearings on the new installation, which all the efforts of the Marconi staff have so far failed to cure. The opinion is being expressed in some quarters that the directional station will have to be removed from its present position to overcome this difficulty. This, of course, would spoil the compact lay-out of the whole control tower.

In spite of the healthy growth in air traffic, the new booking hall has always a singularly deserted look. Rohan et Cie., who kept the combined post-office, tobacco and tuck-shop in a wooden hut on the old site, and did an excellent trade with all classes of visitors to the aerodrome, are now installed in very dignified quarters in two corners of the booking hall. But they find that their trade has practically deserted them, for there are no casual lookers-on to buy chocolates, cigarettes or picture-postcards of aircraft.

CIVIL AVIATION IN AUSTRALIA.

According to *The Times,* the Appropriation Bill, whic has been passed by the House of Representatives and th Senate at Canberra, provides for a grant of £200,000 f opening civil air routes between Perth and Adelaide, Camo weal and Daly Waters, Derby and Wyndham, Melbourn and Hobart, Carleville and Brisbane, and Sydney and Bri bane.

When these routes are established Australia will be e circled, except for the section Darwin-Wyndham, for which is hoped provision will soon be made.

SOUTH AFRICAN AIR MAIL SCHEMES.

According to *The Cape Times* of Feb. 28, which in its tur quotes the Johannesburg *Star* as its authority, the Gover ment of the Union of South Africa has entered into a contra with South African Airways Ltd. for the operation of an A Mail, passenger and freight service between Johannesbur and Durban.

Under this contract the Government will pay an annu subsidy of £8,000 to the company for two years. At the en of that period the subsidy may be reviewed so that the n profit of the company shall not exceeed 10% per annum.

The Government will collect a special fee on all mail se by the service and will turn over the sum so collected le 10% to the company.

Books about the
ROYAL AIR FORCE.

THE WAR IN THE AIR, Vol. I. (Official History). Sir Walter Raleigh. £1 1s.
LAND, SEA AND AIR. Rear Admiral Mark Kerr. £1 1s.
THE HISTORY OF 60 SQUADRON, R.A.F. Group Capt. A. J. L. Scott. 15s.
OVER THE BALKANS AND SOUTH RUSSIA. (History of No. 47 Squadron). A. H. Jones. 10s. 6d.
WAR BIRDS, The Diary of an Unknown Aviator. 7s. 6d.
NOCTURNE MILITAIRE. E. W. Springs. 7s. 6d.
AN ESCAPER'S LOG. D. Grinnel-Milne. 7s. 6d.
LETTERS FROM A FLYING OFFICER. Rothsay Stuart Wortley. 8s. 6d.
RHYMES OF THE R.A.F. C. L. M. Brown. 2s.
R.F.C., H.Q., 1914—1918. Maurice Baring. 8s. 6d.

Many of the books about the Flying Services are now out of print, but copies of those given in the list above may still be had from

THE AEROPLANE BOOK DEPT.,
14, Bream's Buildings, E.C.4.

S.E.SAUNDERS Limited.
DESIGNERS & CONSTRUCTORS OF ALL
DESCRIPTIONS OF
AIRCRAFT in
WOOD AND METAL.
Patentees & Manufacturers of the famous
'CONSUTA' Laminated Wood.
EAST COWES ISLE OF WIGHT.
BUSH HOUSE, ALDWYCH, LONDON, W.C

The Government agrees to advertise the air mail service e of charge in such Post Office publications as conveniently ssible.

An efficient meteorological service is to be established by e Government and the company shall be granted all facili- s for the free use of this service.

The Government agrees not to negotiate during the period the control with any other company for the development other air routes in the Union without informing the com- ny, nor will it sanction any other air service over the route ered by the agreement.

The Government agrees to allow the importation free of stoms duties of all aircraft, engines, spares, etc., needed the service, and also agrees to transport by rail at the vest possible tariff all such goods, and in addition petrol and stores used by the company for the purpose of carrying the agreement.

The Government has further agreed to make all necessary pairs and overhauls to the company's equipment at the uth African Air Force Depot, Roberts' Heights, at cost ce plus 7½% and to supply as far as possible from Air rce stores materials and spares on the same terms.

According to a Reuter message in the same issue of *The be Times*, three D.H.61 aeroplanes are to be used for this vice.

Reports in the English daily Press from Johannesburg nounce that Lt.-Col. G. L. P. Henderson is to open an air il service between Johannesburg and Cape Town in Novem- of this year. Three-engined Junkers machines of the type are to be used because—it is alleged—no British chine of the required type and size is available at anything the same price.

THE A.I.D. DINNER.

The annual dinner of the A.I.D. Technical Staff Associa- n (which is affiliated to the Institution of Professional il Servants) will take place on Friday, April 20, at the tel Russell, W.C.1. Members of the A.I.D. can get kets for themselves and friends at 10s. 6d. each, exclusive wines, from J. Jarvis, Esq., Room 530, Alexandra House, ngsway, W.C.2. Morning dress will be worn.

D. NAPIER AND SON LTD.

The General Meeting of D. Napier and Son Limited was d at 211, Acton Vale, on Mar. 30. Mr. H. T. Vane, .E. (Managing Director), who presided, said :—

proposing the resolution that the directors' report and balance- t for the year ended September, 1927, be approved and adopted, ould point out that whilst the profits disclosed by the accounts w a reduction compared with the previous year due regard uld be given to the circumstances of the trading during the period er review. It must be borne in mind that we depend mainly on rs for our products from British and foreign Governments, but icularly from the British Government, and the policy of the Air istry has been to reduce expenditure to the very minimum, as mentioned recently by the Secretary of State for Air in the House Commons when commenting on the Air Ministry Estimates.

e net profit for the year amounts to £169,036. This, however, in- es interest on British Government securities which you will notice d in the balance-sheet at £994,432, as compared with £943,345 he end of the previous financial year. It is considered desirable etain at present substantial liquid assets in case it is found neces- to manufacture some other class of production.

e capital account is increased by £182,000, being the amount of Preference shares we issued as bonus last year under your sanction. editors and credit balances stand at £258,484, which includes de- s on orders in hand and reserves for taxation, and compares with 980 in the previous year.

e general reserve stands at £350,000.

the assets side of the balance-sheet the first item, freehold and hold land, premises, machinery, plant, tools, etc., stands at 885, as compared with £234,451 in the previous year. This figure lculated after allowing for depreciation on the same basis as in ious years and for additions during the year.

r stock and work in progress at £212,775 shows an increase com- d with the previous year of £27,808, but is some £38,000 less com- d with our figures for the year ended September, 1925.

ring the past trading year, whilst our factory has been kept ing more evenly, we have had to take risks of putting in hand uction in advance of actual orders to attain this. This course ction has been justified, but is, you will understand, a point h has to be very carefully watched, having regard to the nature ur manufacture. We are in the unique position of being the company in this country concentrating on the manufacture of engines only.

r designers and engineers are continually developing and im- ng our aero-engines in order to maintain our reputation for making the best and to keep the Napier in the forefront. You have seen nce of their success in this direction by the outstanding successes ved with Napier aero-engines during the past year.

are confident that the experience gained in the developing and ruction of high-speed aero-engines will be of great assistance in ling us to increase the performance of aircraft with our future lard type of engine.

t to give you some idea of the great strides we have made, pleased to tell you that the power developed from these high- engines is nearly double, although the weight is somewhat less that of our present standard engine.

I will just mention some of the principal successes with Napier engines since we last met—for instance, the Schneider Trophy national Race, held at Venice last September, was won by Flt. Lt. Webster on a Supermarine seaplane fitted with a Napier engine, at a speed of 281.6 m.p.h. This was referred to by *The Daily Mail* as a "triumph for British engines," and THE AEROPLANE, in describing the race, stated that, "thanks primarily to the Napier engine, we have demonstrated beyond argument that we can beat the world in speed contest, as in everything else." The result did, in fact, give us a world-wide Press eulogy.

This event really was a wonderful one, as never before had such speeds been attained, and the world's "record" for 100 kilometres was broken at the same time, the speed being 283.313 m.p.h. This success to British prestige all over the world, and to British aviation in particular, coming at that time, was most impressive and significant.

As an instance of reliability, I must refer to the wonderful R.A.F. official flight of four Supermarine Southampton boats, flying to Australia under the command of Grp.-Capt. Cave-Browne-Cave, each fitted with two Napier engines. So far these machines have flown in formation from Plymouth to Singapore, a distance of 10,625 miles, or 85,000 engine-miles. This flight has been carried out without any mechanical trouble, and never before has such an ambitious cruise been attempted by any country. It is gratifying to know that the Napier engine was selected for this epoch-making flight. In May the machines leave Singapore for Australia.

As in 1926 and 1927, the R.A.F. are now engaged on another Cairo-to-Cape and back flight. As in those two years, the engine that has been selected to undertake this Service expedition this year is the Napier Lion. All successful long-distance flights in the past year by the Royal Air Force have been done with Napier engines taken from stores, and not in any way specially prepared.

As to the future, I think it will be understood that our reputation for the manufacture of aero-engines of high efficiency will ensure our receiving a fair share of aero-engine orders. Further than this I can assure you that your directors are fully alive to the necessity of keeping ahead of the times, and particularly to develop new productions, but I am precluded from giving particulars of these, in deference to the wishes of the British Air Ministry.

The report and accounts were unanimously adopted.

PERSONAL NOTICES.

DEATHS.

KIMBERLEY.—On Mar. 28, near Amman, Transjordan, as the result of a flying accident, L-AC. James Kimberley, R.A.F.

McCORMACK.—On Mar. 28, near Amman, Transjordan, as the result of a flying accident, Flt. Lt. George McCormack, No. 14 (Bombing) Squadron, R.A.F.

Flt. Lt. McCormack was born in Belfast. He went overseas with the Ulster Division and fought with them through the battle of Messines. He was seconded to the R.F.C. in 1917 as an observer. After the Armistice he was posted to No. 20 Squadron, R.A.F., then stationed at Bannu, and was made a prisoner and eventually ransomed after a forced landing in hostile territory in Waziristan. After his return from India he underwent a course at the School of Photography at Farnborough and in 1923 was posted to No. 111 (Fighter) Squadron at Duxford. He was promoted to be Flight Lieutenant in January, 1927, and in December, 1927, he was posted to No. 14 (Bombing) Squadron at Amman.

MARRIAGE.

BULAY-WATSON—MYCOCK.—On Mar. 26, at the Chapel of the Savoy, Donald Bulay-Watson, A.F.C., only son of Sir Francis Watson, M.P., and Lady Watson, of Torracks Hill, Poole in Wharfdale, to Gwendolyn Maud Mycock, youngest daughter of the late Mr. W. Pritchard Davies, of Woodlands, Chorlton-cum-Hardy, and Mrs. Davies, Boverton, Hampton Wick.

BIRTHS.

SCRIVEN.—On Mar. 28, at Hides Close, Beaulieu, Hants, to Hilda (*née* Grice), wife of Sq. Ldr. V. R. Scriven, A.F.C., R.A.F.—a son.

WILSON.—On Mar. 15, at 145, Market Street, St. Andrews, to the wife of J. B. Wilson, Flg. Off., R.A.F.—a son.

BALLOONS, PARACHUTES, Etc.
FLOTATION R·F·D AIR BAGS
COMPANY
17, Stoke Road, Guildford, Surrey.

Learn to Fly in the Shortest Possible Time
by joining
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LIVING ACCOMMODATION ON AERODROME.
Engines and machines specially tuned and rigged for Racing.
The following "FIRSTS" were gained last Season by machines reconditioned and specially tuned by THE HENDERSON FLYING SCHOOL :— MACHINE.
Air League Race Challenge Cup - A.N.E.C.
Morris Cup - - - S.E.5A.
Ladies' Cup and Purse (Liverpool) - S.E.5A.
Liverpool Civic Week Cup - - S.E.5A.
Rodman Cup - Airdisco S.E.5.
Restaurants and Hotel Handicap - Renault Avro.
Take advantage of our experience and consult us.
Any type machine supplied at List Price. Cirrus Service Depot.
HENDERSON FLYING SCHOOL, Ltd., Brooklands Aerodrome, Byfleet.
Station : West Weybridge. Phone : Byfleet 437.

MISCELLANEOUS ADVERTISEMENTS.

All Advertisements for this column should arrive at this office by 6 p.m. Monday, to ensure insertion.

For the convenience of Advertisers, replies can be received at the office of The Aeroplane, 14, Bream's Buildings, London, E.C.4.

Special PREPAID Rate—18 words **3/-**; Situations Wanted ONLY—18 words **1/-**. 2d. per word after.

MISCELLANEOUS.

Pilot-owner required, "B" Licence, Male, for touring country, expenses covered, send details—BCM/SK2Y, W.C.1.

Practical Petrolmotor Castings, Half horse-power, 9s. 9d., with cylinders bored.—Catalogue, 3d., Madison's, Harrington Road, Littleover, Derby.

PATENTS.

STANLEY, POPPLEWELL AND FRANCIS, International Patent Agents, Jessel Chambers, 88, Chancery Lane, W.C.2. Telephone, Holborn 6393; Telegrams, "Notions, London."

AERODROME LIGHTING.

Mobile Combined Beacon Floodlights. Emergency Signalling, Navigation, High Intensity, Lenses, Carbons, Strands, Cords. The London Electric Firm, Croydon.

AIR SURVEY.

Air Survey Company Ltd., 3, Copthall Buildings, E.C.2. L.W. 9850. 39, Grosvenor Place, S.W.1. (Sloane 6048), and Monkey Point, Rangoon.

The Aircraft Operating Co., Ltd., 8, New Square, Lincoln's Inn, London (Holborn 0726) and Bulawayo, Southern Rhodesia: Contractors to the Ordnance Survey. Laboratories and Subsidiary Company for aerial photography in the British Isles, **Aerofilms, Ltd.,** The Hyde, Hendon (Colindale 6157).

AIRCRAFT INSTRUMENTS.

Radiator Thermometers, Cambridge or Foxboro, 8s.; Airspeeds, 10s. 9d.; Altimeters, 10s. 6d.; Revolution Indicators, Smiths, 600-2,600 r.p.m., with drive, 22s.; Oil and Air Pressure gauges, 4s. 6d.; Levels (cross), 1s. 9d.; Fore and Aft Inclinometers, 6s.; Aeroplane Wheels with tyres, tubes and axle, per pair, 40s.; Postage paid on above. Send for list of extensive stock to Coley Ltd., Ordnance Works, Queen Elizabeth Road, Kingston-on-Thames. 'Phone 0365.

ENGINES FOR SALE.

Aero-Engines and Spares. Stockists of Puma, Rolls, Fiat, Sunbeam, Le Rhone and other engines; Spares for above and 23 other types. Northern Engineers Supply Co., Abbey Mills, London, E.15. Maryland 1909.

ENGINES WANTED.

Curtiss OX5 engines wanted, new or used, also spares. Apply Box No. 5472, The Aeroplane, 14, Bream's Buildings, E.C.4.

Liberty engines and parts. Hispano geared 220 h.p. engines and parts.—Apply Box No. 5472, The Aeroplane, 14, Bream's Buildings, E.C.4.

MACHINES WANTED.

Light Aeroplane Club wish to acquire second-hand or reconditioned machines.—Full particulars to Box No. 5485, The Aeroplane, 14, Bream's Buildings, E.C.4.

AVIATION INSURANCE.

Before Effecting or Renewing Insurances communicate with **Bray, Gibb and Co., Ltd., 166, Piccadilly, W.1, who will gladly give advice and quotations.**

FLYING CLOTHING.

Lewis' Flying Equipment.—Genuine R.A.F. new flying suits fitted fur collars 58s. 6d. all sizes. R.A.F. pattern leather flying coats lined best fleece £5 5s. Hundreds of other types from 70s. to 105s. Aviation Mask goggles fitted genuine Triplex lenses clear 12s. 6d. per pair, tinted 13s. 6d. Featherweight model fitted genuine Triplex lenses, tinted 7s. 6d., clear 11s. Pilots' muffle gauntlets 10s. 6d. R.A.F. pattern flying helmets 8s. 6d., 11s. 6d., 12s. 6d., 14s. 6d., all fur trimmed. Flat or round type of earphones fitted 5s. extra. Metallic tubing and rubber connection 3s. 6d. set. Y Pieces 2s. Flying Schools please note. White flying suits all sizes 30s. Contractors to Foreign Governments for flying equipment. Lewis, Leather Clothing Manufacturer, 19 and 27, Carburton Street, London, W.1. Museum 4793.

Wainwright's Flying Clothing.—Genuine R.A.F. new "Sidcot" flying suits, fitted fur collars, all sizes, 65s. Full chrome R.A.F. pattern tan leather flying coats, £6 6s. R.A.F. Pilot's gauntlet gloves, 10s. 6d. per pair. Flying helmets, fur trimmed, 12s. 6d. Leather breeches, 35s. and 55s. Write for catalogue—Wainwright's, 300 and 302, Euston Road, London, N.W.1. 'Phone: **Museum 6280.**

AIR TAXIS.

Air Taxis, Ltd., Stag Lane Aerodrome, Edgware. Phone Colindale 6307.

PROPELLERS.

The fastest, lightest and most efficient all-metal propelle yet produced, 100 to 145 m.p.h., to suit Cirrus engines £1 Similar to suit Genet engines £18. Let us send you o prospectus. The Normal Propeller Co., 7, Buckley Roa London, N.W.6.

EMPLOYMENT.

All seeking Aviation Employees or Employment should con municate with Capt. F. Warren-Merriam, A.F.C., A.F.R.Ae.S agent for Air Lines, British Aviation Insurance Group, etc. his Employment Bureau is authorised and licensed by th L.C.C. Address, 64, Victoria Street, Telephone Victoria 842

SITUATIONS VACANT.

Draughtsman, Senior, required. Aircraft experience esse tial.—Apply stating particulars and salary required to Bo No. 5483, The Aeroplane, 14, Bream's Buildings, E.C.4.

Engineering Fitter-Erector with experience of aircraft co struction required for Inspection Department. Preferen to Applicants with Ground Engineer's Licence "A" "B." Give full details of experience and state wage r quired. Westland Aircraft Works, Yeovil.

Wanted Experienced Senior Aircraft Draughtsmen.—Appl stating experience and salary required, to Box No. 5482, T Aeroplane, 14, Bream's Buildings, E.C.4.

SITUATION WANTED.

Practical Engineer, age 34. Wide experience on aircra and metal fittings. Rate fixing and organiser, discipli arian. R—, 38, Spencer Square, Ramsgate.

WANTED.

Wanted, Aircraft engines and aircraft material.—Apply B No. 5484, The Aeroplane, 14, Bream's Buildings, E.C.4.

PRACTICAL FLYING.

Learn to Fly by joining the Midland Aero Club, Cast Bromwich, Birmingham. Full particulars on application Hon. Sec. Major Gilbert Dennison, 22, Villa Road, Hand worth, Birmingham.

Learn to fly at the Hampshire Aeroplane Club at a to cost of £14. Write for particulars to the Secretary, at Hambl Southampton.

Learn to Fly with the Newcastle-upon-Tyne Aero Club. F particulars and illustrated booklet from Secretary, Cramlin ton Aerodrome, Northumberland.

London to Norwich Aero Club, 100 miles only. Spec facilities are offered to prospective visiting pupils. Moder instruction fees, well appointed club, complete staff. quiries to F. Gough, Hon. Manager, Aerodrome, Sprowst Norwich.

Henderson Flying School Ltd., Brooklands. Spring term now opening. Accommodation on Aerodrome. Avro machin Chief Instructor, Capt. H. D. Davis, A.F.C. 'Phone: Byfl 437.

The De Havilland School of Flying, Stag Lane Aerodron Edgware, Middlesex. Twelve machines: Seven Moths, fi advanced training machines. Five Pilot Instructors, Lectu Classes, Restaurant and Recreation Pavilion. The large and most up-to-date civilian organisation for flying tuition the British Empire.

BOOKS WANTED.

Wanted:—One copy of each of the following publication

1. "Notes on the Tilt Finder" by Lt.-Col. M. N. MacLe published by the Air Ministry, London. (Illustrat booklet.)
2. "A Proposal for Plotting Planimetry and Relief fr Air Photographs" by Lt.-Col. M. N. MacLeod, published the Air Ministry, London. (Illustrated booklet.)
3. "Methods of Map Making from Aeroplane Photogra used by the Survey Department, Giza, Egypt," published the Air Ministry, London. (Leaflet.)
4. "Mapping from Aeroplane Photographs, Survey Egypt," published by the War Office, London. (Illustrat booklet.)
5. "Notes on Aspect Photographs," by D. H. Thom published by the Air Ministry, London. (Illustrated bookle
6. "A Graphical Method of Determining the Constants a Plate," by the Geographical Section, General Staff, Ministry, dated February, 1922. (Illustrated booklet.)
7. "Notes on Aerial Photography, Parts 1 and 2. The terpretation of Aeroplane Photographs in Mesopotamia," the R.A.F., Mesopotamia.
8. "Aerial Photography, Part II, Developing, Printi etc." (Air Publication 812.)

Anyone having a copy of any of the above publications sale please communicate with the Editor of The Aeropla stating price desired.

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THE AEROPLANE—APRIL 11, 1928.

LIGHT AEROPLANES

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 15. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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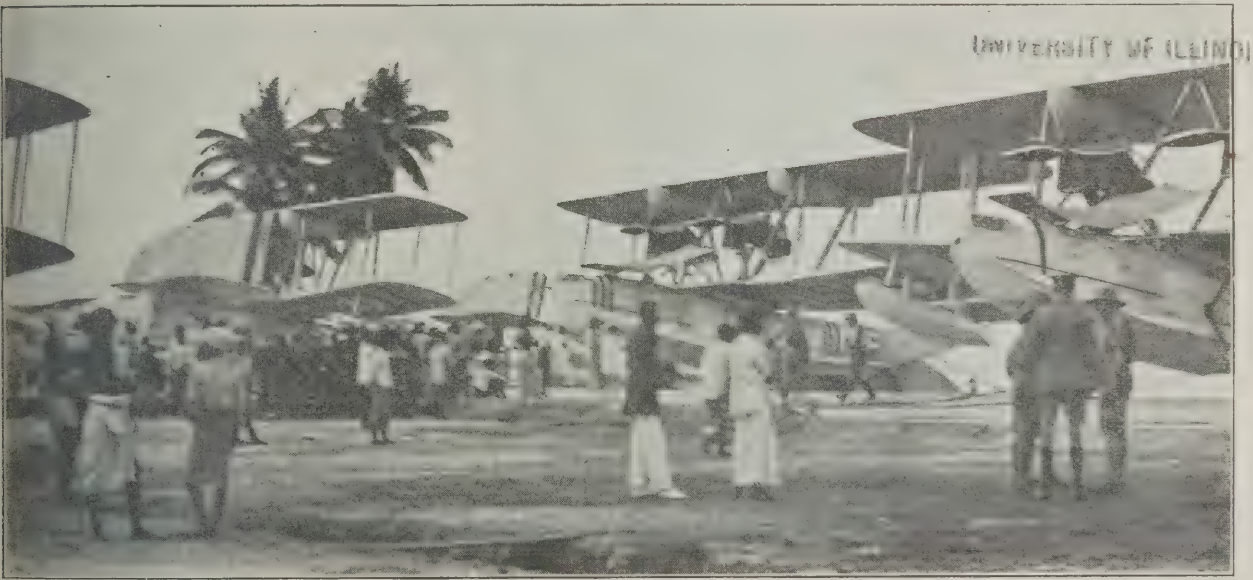
"THE SECOND DOORWAY OF THE WIDE WORLD'S TRADE IS MINE TO LOOSE OR BAR."—*(Kipling.)*



SINGAPORE:—The four Supermarine Southampton flying-boats (Napier Lion engines) of the R.A.F. Far East Flight at Singapore, where they arrived on Feb. 28 after flying a distance of 10,625 miles.

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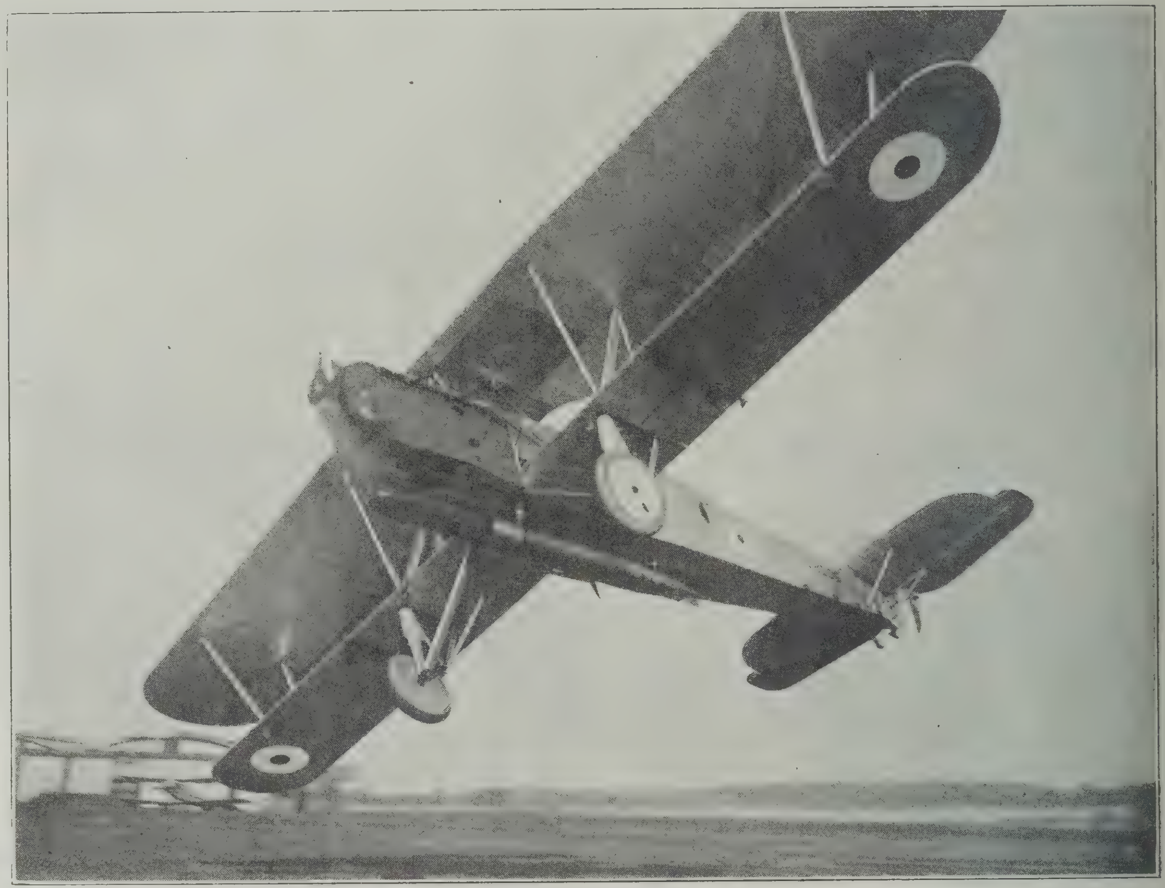

"*Flight*" *Photo.*

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APR. 11, 1928.

THE AEROPLANE

Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 15.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings. E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months 15s.; 12 months 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months. 35s. Canada, 1 Year, 8$.
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ON LIGHT AEROPLANES.

Whatever may be our sins of omission and commission in ur choice of the types of aircraft which we try to sell in arkets overseas, however wrong we may be in not producing middle-sized commercial machine and however far behind-and we may be in not having high-speed fighters even for ur own Air Force, there is at any rate one class of aero-lane in which the British Aircraft Industry is unapproached, -that is the sort commonly called Light Aeroplanes.

For competition purposes the *Fédération Aéronautique nternationale* has fixed on certain figures limiting the eight of machines which are recognised as being in the ategory of Light Aeroplanes. The figures are :—1st Cate-ory. Single-seaters of less than 200 kgs. weight empty, nd Category. Single-seaters of from 200 to 350 kgs. weight mpty, 3rd Category. Two-seaters up to 400 kgs. weight mpty.

In practice these only concern people who want to fly competitions or to capture records. For trade purposes future each individual maker will presumably call a achine a light aeroplane, or not, according to his fancy, ist as in the Motor Trade one maker's "Light Six" may e about twice the weight and power of somebody else's andard saloon. And so we may in time find the maker what the papers call "a giant airliner" putting on the mar-et also a five-seater of two or three hundred horse power and lling that his particular brand of light aeroplane.

To-day a light aeroplane is generally taken to mean any vo-seater with an engine of 100 h.p. (plus or minus 10 or h.p.). And in this class British aircraft constructors are r ahead of anybody on either side of the Atlantic.

At the same time we shall do well to take care that we not spoil our reputation, and our markets, by merely amming on more and more power—as we have done ith our War-machines. An article by that experienced lot of all types of machines—more especially light aero-anes—Mr. Neville Stack, which appears elsewhere in is issue, deserves the particular attention of designers d users alike.

THE WORLD'S LIGHT AEROPLANES.

The De Havilland Moth, the Avro Avian, the Westland Widgeon, the Blackburn Bluebird, and the very latest addition, the Parnall Imp, form a class to themselves in all the World's two-seater aircraft. And the De Havilland Tiger-Moth, although only one of it exists to-day, may fairly be taken as the basis of another class in which we excel.

In America there are vast quantities of two-seaters and even three-seaters, using the good old reliable Curtiss OX engine of approximately 90 h.p., for power plant, but they cannot be classed in the same category as our machines. Practically all of them are bigger and heavier and very much slower. Also, having water-cooled engines, they are not in the same class for simplicity of upkeep, or for reliability.

Incidentally there is a famine in Curtiss OX engines. All reserve stocks have been used. The oldest of old engines are being rebuilt. And, one is told, an American speculator has bought from our A.D.C. Aircraft Ltd. all the OX engines which we bought early in the War 1914-18 for the training machines sold to us by the Curtiss Co. Consequently various American firms are busy designing engines to replace the OX, mostly based on our Cirrus design.

In Germany a number of highly-efficient light aeroplanes have been built, but, to adopt a boxing analogy, they are in the Bantam Class rather than in the Light-weight Class.

Incidentally,—we might very well classify our aircraft according to boxing categories, for between these Bantams and the Light-weight class there may be a revival of machines something like the Baby Avro,—which would be in the Feather-weight class. The highly successful American 200 h.p. five-seaters might reasonably be put in the Welter-weight class. And presumably such things as Argosies and the big flying-boats would go in the same category as the Chichesters and Beamishes or the Phil Scotts and Gene Tunneys,—according to whether they were privately owned or merely commercial.

THE BANTAM-WEIGHTS.

The German Bantam-weights certainly have put up marvellous performances. Tiny monoplanes with two-cylinder double-opposed pop-bottle engines have made astonishing voyages. So long ago as September, 1926, Herr Eberhard

JUST OFF.—**Mr. Hubert Broad on the De Havilland Company's demonstration Moth (A.D.C. Cirrus engine) taking off at Lympne during the Cinque Ports Flying Club meeting.**—("*Aeroplane*" *photograph.*)

von Conta and Dr. Ing. von Langsdorff, on a Messerschmitt light monoplane (Bristol Cherub engine) voyaged from Germany to Italy over the Alps. At the time of the last R.A.F. Display Capt. Loerzer, one of Germany's finest fighting pilots, demonstrated the Klemm-Daimler at Croydon and showed that it was thoroughly airworthy. And quite recently Mr. Kern and Mr. Seypelt, also on a Klemm-Daimler two-seat monoplane, made a tour of over 3,000 miles of Western Europe.

But the objection to all these machines is that although they are quite airworthy they are too slow to make any worth-while progress against a strong wind, and that if one of their two cylinders goes sick, without actually cutting out, the drop in power is so great that a forced landing must be made on the spot.

We in this country have built some highly successful aeroplanes which might be included in the Bantam class. The Hawker Cygnets, which won *The Daily Mail's* big prizes at Lympne, the De Havilland 53s, the Parnall Pixies, the Bristol Brownies, the Beardmore Wee-Bee and the A.N.E.C., all performed excellently with their Bristol Cherub engines. But, quite definitely, and quite rightly, our aircraft manufacturers have come to the conclusion that for a real light aeroplane, capable of serious every-day flying, the multiple-cylinder hundred-horse-power-more-or-less engine is necessary.

Our Light Engines.

For the success of our light aeroplanes we must certainly give credit primarily to A.D.C. Aircraft Ltd. and Major F. B. Halford for producing the four-cylinder-in-line Cirrus, and to Armstrong-Siddeley Motors Ltd. for producing the five-cylinder radial Genet. If engines of their power and weight had not been produced when they were, we should have been in no better position than are the American and German manufacturers to-day.

This fact is fully recognised in the States, for a number of firms are making strenuous efforts to produce engines in that class within the next twelve months. In fact one firm, which is nearly the largest producer of automobile engines (as distinct from complete automobiles) in the States, is laying plans to produce two engines, one of approximately 100 h.p. and one of approximately 250 h.p., with the intention of flooding the World with them.

This is a development which our own manufacturers of engines for light aeroplanes will do well to watch. For unless they can get down to something like American mass-production prices we may well find countries which up to the present have been, and for the next twelve months may still be, very good customers for our complete light aeroplanes, starting to build their own light aeroplanes with American engines.

We must remember that countries which cannot build War machines, or even big commercial machines, because of the expensive plant needed, can easily build light aeroplanes, if they can buy cheap engines. Australia does not build motor-cars. But quantities of car bodies are built in Australia onto American chassis.

What The Moth Has Done.

In the meantime we are at the top of the tree both in aeroplanes and engines in this class. The award of the Britannia Trophy for 1927 to Mr. R. R. Bentley for his single-handed flight to South Africa on a Moth (Cirrus engine) was thoroughly just. The Committee who made the award must have had considerable difficulty in deciding whether to award the Trophy to him or conjointly to Messrs. Stack and Leete for their journey to India on two other Moths with Cirrus engines. But nobody, least of all their sporting competitors, will quarrel with the decision.

We also had last year Mr. Rooke's journey to India, which was a fine effort although it ended unfortunately. A number of good tours were made on the Continent with Moths last year and a whole flock of these machines flew to Venice for the Schneider Trophy Contest. This year Lady Bailey's flight to Cairo, even if she had never got any further, was the longest flight ever made by a woman pilot. And her further progress is remarkable.

Purely commercially the Moth has done very well indeed. Either with wheels or floats they are used all over every British Dominion and in practically every foreign country where there are flying clubs, or where there is any civil flying at all. And the present output of Moths, which is already half-a-dozen a week and is likely to be much more within the next few months, amounts to a turnover which would represent very handsome production orders from the Royal Air Force, even for big war machines.

The recent "windfall," when four consecutive days brought orders for forty-nine Moths may be only a foretaste of what will some day be a regular rate of business. The history of the Motor Trade points to its being so.

The Avian's Records.

The Avian, though it came into the World comparatively lately, has already made its name as a first-class aeroplane. Mr. Hinkler's splendid flight to Australia proved that his record-breaking non-stop flight from London to Riga last year was no fluke either for pilot, engine or machine. And the arrival of the "Red Rose" in Australia with Mrs. Keith Miller and Mr. Lancaster on board is corroborative evidence of the excellence of the Avian and the Cirrus.

The Westland Widgeon has proved not only by its speed in races but by a very gruelling tour made on one such machine on the Continent by two R.A.F. officers last Autumn tha the light monoplane can hold its own against the biplane.

And the Blackburn Bluebird, used as it has been for touring England and for quantities of schoolwork, has also shown itself worthy to rank as a first-class aeroplane.

Production and Price.

Increased production has naturally caused decreased cost

WELL OFF.—Mr. F. P. Raynham on his Avro Avian (A.D.C. Cirrus engine) flying at the Hadleigh meeting of the Suffolk Aeroplane Club.—(*"Aeroplane" photograph.*)

Reliability!

"AFTER flying 10,000 miles from Plymouth with the regularity of ocean liners, the Royal Air Force Squadron of four flying boats [Supermarine 'Southamptons,' each fitted with two Napier engines], arrived at their Singapore base yesterday afternoon.

Group-Captain Cave-Browne-Cave, who is in command of the squadron, told an interviewer that the flight had been very successful. The condition of the bases on the way had been excellent, *and the engines had been running very well.*

The remarkable feature of the flight has been its reliability and freedom from mishap. The cruise has been carried out according to schedule, without a single mishap."

Daily Sketch, 29th Feb. 1928.

The aircraft are—
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The Moth, which began its career on the market at £885, is already down to £650,—and is not much more with the life-saving slot control. This decrease is mostly due to decreased production-costs in the machine itself, the balance being due to the decrease in the price of the Cirrus engine, which has also been cut by increased production. And now the Avian has come down at one cut to £600. At which price, with the advertisement of the Australian flights to help it, it should have a big, and ever-increasing, sale.

Thus we are evidently not so very far away from the £500 aeroplane of which one wrote, and for which one was so much ridiculed, when light aeroplanes were first produced. The sum of £500 struck one then as being the figure which might be expected to produce a sudden rise in the sales of such machines. And one still believes that when that price is reached there will be an upward jump in the sales charts. In the meantime, anyone who is keen on flying and can scrape together the extra £100 or £150 will be very silly to lose a year or two of flying by waiting for the price to drop.

Sales are following very much the course which motor-car sales ran in the early days of motoring. Cumbersome cars of the early get-out-and-get-under period were sold at anything between £800 and £1,000. The owners had to be enthusiastic and comparatively rich at the same time. Slowly at first the enthusiasm increased and so did the sales, and with the increased sales came gradual reduction in price. Also with the reduction in price came increased sales. But as soon as the price of a reasonably reliable car came down to about £500 a completely new class of customer came into the market.

In those days anything like a journey by motor-car was at least as much an adventure as a voyage of three or four times the distance in a light aeroplane to-day. Those who read Charles Jarrott's *Ten Years of Motor Racing* can form some idea of what motoring was like in the days before the £500 car.

"Where We Are At" (*American*).

To-day, we have reached in Aviation a period very much like that of about 1907 to 1909 in the history of motoring. People no longer look at flying as a very great adventure. Even the person who has no intention of owning an aeroplane regards the owner-pilot merely as a good sportsman and not as a would-be suicide.

A forced landing by an Imperial Airways liner is now recorded in the evening papers because it is an unusual occurrence, like the holding up of a Channel steamer. It is no longer a sensation described as a miraculous escape from death.

One doubts whether one person in fifty in any ordinary crowd to-day, of any grade of society, would refuse a free flight because he or she was afraid of being killed. And there are still people alive to-day who are afraid to travel in a motor-car or even a railway train.

One thing which is immensely in favour of the light aeroplane is the continuing increase in the sales of motor-cars. Though personally one has not seen a main road of any kind for sixteen weeks or more, one is told that on one or two fine Sundays recently the roads round our big cities have been more crowded than they were in the height of the Summer last year. So evidently this year, in the season when the new motorist and the old charabancs driver compete each week-end for every square inch of road, there will be no pleasure in life for the young sportsman and sportswoman who hitherto have driven for driving's sake. More than ever this year will there be reason to heed the De Havilland slogan "Get off those crowded roads."

One believes that the people of the young sporting class will provide the most notable increase in sales of light aeroplanes in the near future. The possible uses of the light aeroplane, in this country at any rate, must necessarily appeal to them more than to anybody else.

Air Parks.

Thanks to the constitutional slowness of our City Fathers and Urban Uncles we do not yet rejoice in Municipal Air Parks, of which America already has something like two thousand. We shall have them some day, but not yet. Meantime the sporting aviator is somewhat limited in his or her choice of landing grounds. And, for Business' sake, let us call them Air Parks. In spite of Mr. Shakespeare there is a heap in a name, and people will go to an Air Park to fly and to see flying, when a "Port" only suggests docks, and a "Terminal Aerodrome" suggests an unregenerate Charing Cross or Waterloo.

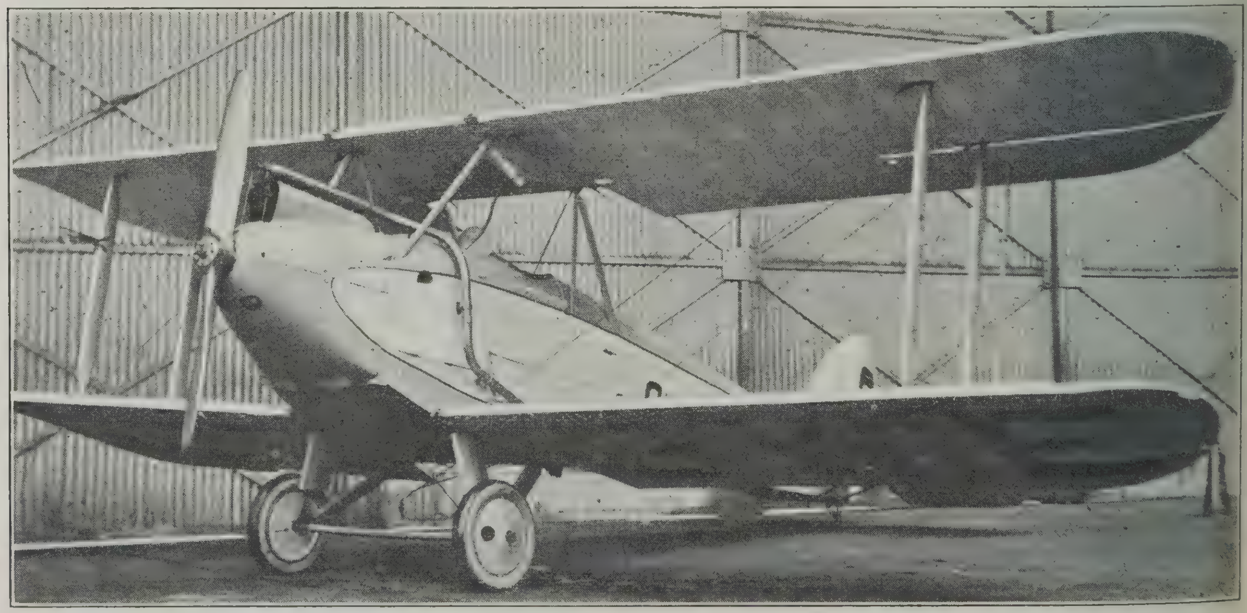
There is a very fine scheme on foot, about which one cannot as yet say anything, to maintain a constantly revised list of possible landing-grounds all over the British Isles. But at present the sporting aviator can only use such aerodromes as are used by the Flying Clubs, and a certain number of R.A.F. aerodromes, and individual landing-fields of which he or she has personal knowledge. Consequently the aeroplane cannot as yet be used like a motor-car.

Usefulness.

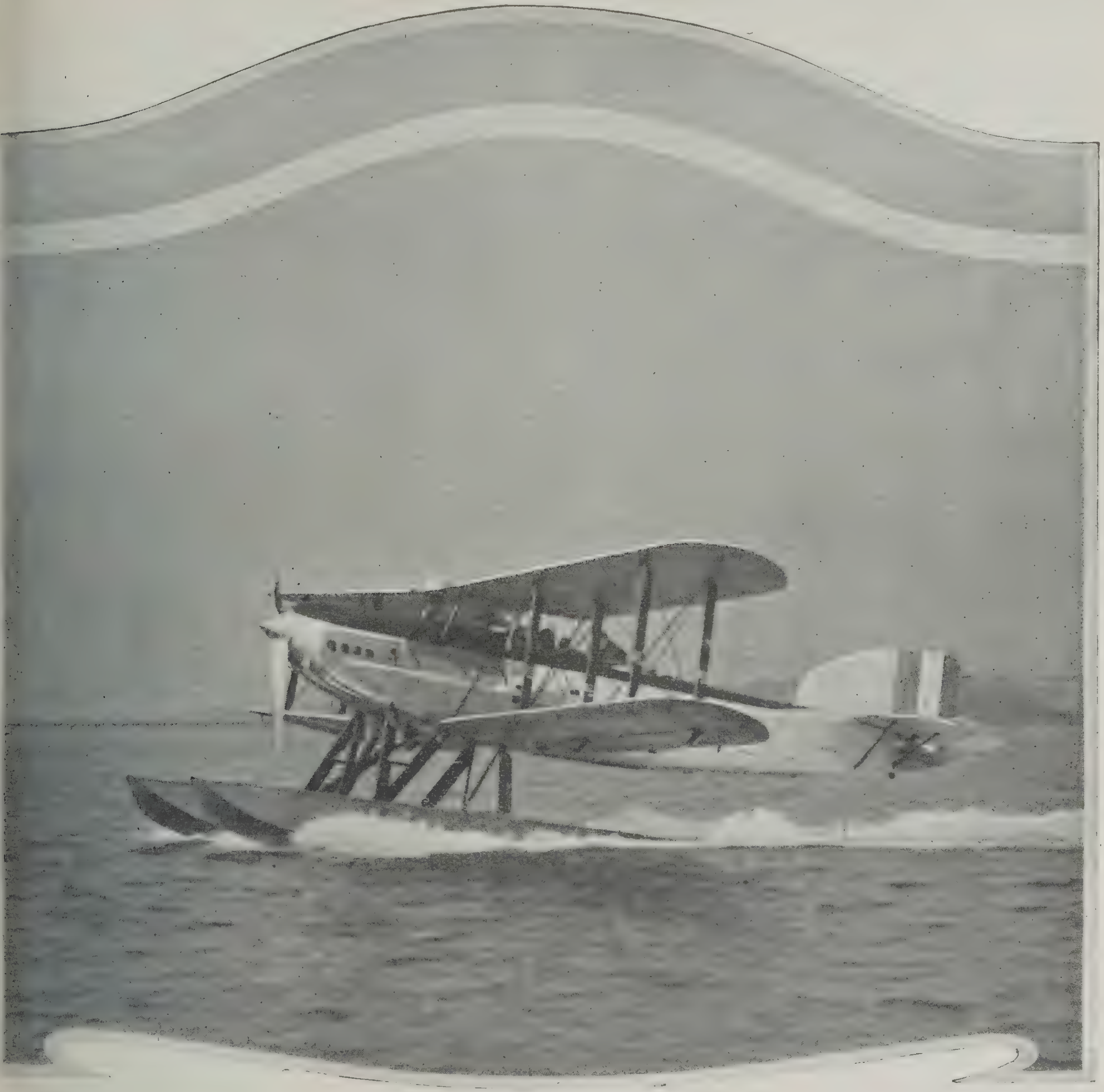
Actually the usefulness of a private aeroplane is between that of a motor-car and a motor-boat. One has to go to an air park, or air port, to fetch the craft, just as one has to go to a river or a harbour to fetch the motor-boat. Only those owners of private parks, or people who are happy enough to live on the edge of somebody else's private park or the edge of an aerodrome, can keep a private aeroplane in their own backyards.

But, when one has started from the aerodrome one can at any rate go in any of a number of different directions, and one is not tied to a river or a coast-line as one is with a motor-boat. And above all things, one is not hampered by those awful new and ignorant drivers of small cars,—whose insurance rates have very sensibly been heavily increased seeing that the driver of the small car is not only the victim but the cause of the majority of motor crashes in these days. Parenthetically, one may add that the really fast driver of a big car is hardly ever the cause of an accident.

Undoubtedly the air will very soon provide the best outlet for the energies of the type of young man and woman who hitherto has delighted in speed on the road. And one



THE LATEST BLUEBIRD.—The first Blackburn Bluebird to be fitted with an A.D.C. Cirrus II engine.
("Aeroplane" photograph.)



The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier "Lion" engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

strongly recommends makers of light aeroplanes to pay special attention to that class of customer.

Sowing The Seed.

There is undoubtedly going to be quite a sudden increase in the home market through this class. Pilots like the Honourable Lady Bailey and Lord Ossulston and the Master of Sempill and Sir John Rhodes, not to mention quite a number of other more or less well-to-do people in the right class of society, have already influenced in the right direction thousands of people of their own class by showing them how an aeroplane can be used as an ordinary sporting vehicle. Such trips as those of Col. Sempill from his home near Aberdeen to John O'Groats and back in an afternoon, and Lady Bailey's daily trips from London to Newmarket and back during the race week, only show what can be done and what will be done as flying of that sort increases in quantity.

Furthermore, the remarkable tours made by the Duchess of Bedford, with Mr. Charles Barnard as pilot, have shown what is possible for the private owner. These journeys have not been advertised as have minor flights by those who suffer from a craving for publicity, but they have had far greater influence among people of the better class than any self-advertising flights could have.

Also, we shall do well to remember that flying is rapidly becoming safer, both through the increased reliability of engines, and the recognition, at long last, by other aeroplane makers of the fact that the Handley Page Slot is in fact a valuable insurance against accident in forced landings.

Thus, exactly as in the early days of motoring, we have increased reliability, increased safety, and decreased price all progressing at the same time towards making a bigger market.

Overseas Trade.

In this article one has said nothing about the uses of light aeroplanes in the British Dominions overseas and in foreign countries. But precisely the same arguments apply. Ranchers, or the owners of big sheep-runs and cattle-runs, accustomed to living dangerously on wild horses, trouble themselves little about the actual danger of flying existing aeroplanes. Price and reliability concerns them more. But increased safety is all in favour of increased sales.

Consequently, as thinly populated countries become more thickly populated, more especially in Central Africa and Australia, there must be a big market for privately-owned aeroplanes, as well as for welter-weight passenger-carriers. But, in spite of, or because of, our horrible climate, one believes that the first big jump in sales will come at home. At any rate, people who buy aeroplanes here can fly them about on the Continent, where there are rather more aerodromes to the hundred miles than we have, and very many more open landing spaces.

And here, just because there is likely to be this increase in the demand at home, one would like to repeat the warning which one gave some weeks ago, that we must not let the home demand distract our attention from sales abroad. If we do we shall find that while we have been looking after our home market the ever-ready American has produced something cheaper than we have got—something which perhaps is not so well made or so nicely finished, but does the job just as well—and is selling it in our Dominions overseas at about two-thirds of our price.—C. G. G.

THE END OF THE LIGHT AEROPLANE.

By T. Neville Stack.

What is happening to the light aeroplane?

There has arisen a grave danger that must be combated, a menace that may mean extinction to the light aeroplane. This, the most popular vehicle of the air will rapidly disappear if the policy at present in vogue, and adopted by the manufacturers of these handy fly-abouts, is carried on.

The light aeroplane as we know it to-day is deservedly popular on account of:—*Firstly*, its economy in running, *Secondly*, its great reliability, *Thirdly*, its ease of maintenance.

Look around at the Flying Clubs alone. Could they have carried on had the cost of flying been as great as in the days before the light aeroplane? It is very doubtful!

Would there have been as many private owners had there been no light aeroplanes? I wonder!

The light aeroplane has brought practical flying within the reach of hundreds who otherwise could not have flown on account of the expense.

We want to keep the light aeroplane a *Light Aeroplane*, not only in name but in fact.

Are we doing so? The answer is No!

Slowly, but surely, the economical light-powered aeroplane is being pushed aside. This will not do.

After numerous trials, tests, and experiments with very low-powered machines had been made, a happy compromise between high and very low power was eventually effected, and the economical, handy machine of to-day, powered somewhere between 20 and 100 h.p., was produced. 100 h.p. is enough, why go beyond this for any practical purpose?

Power is not everything. Power is expensive. Power needs more fuel.

Power means greater structural strain, and power and more power will make the light aeroplane no longer a light aeroplane.

What is a Light Aeroplane? It is a light-powered aeroplane. Can you call over 100 h.p. light?

Why don't we better the performance of our aeroplanes by improvement in design aero-dynamically, and not content ourselves by boosting up the performance of the machine by simply installing a higher-powered engine?

Why not make use of the power we already have, and improve the design of our aircraft, thereby producing altogether a more efficient aeroplane, and keeping the running costs down, both to the purchaser and to the user?

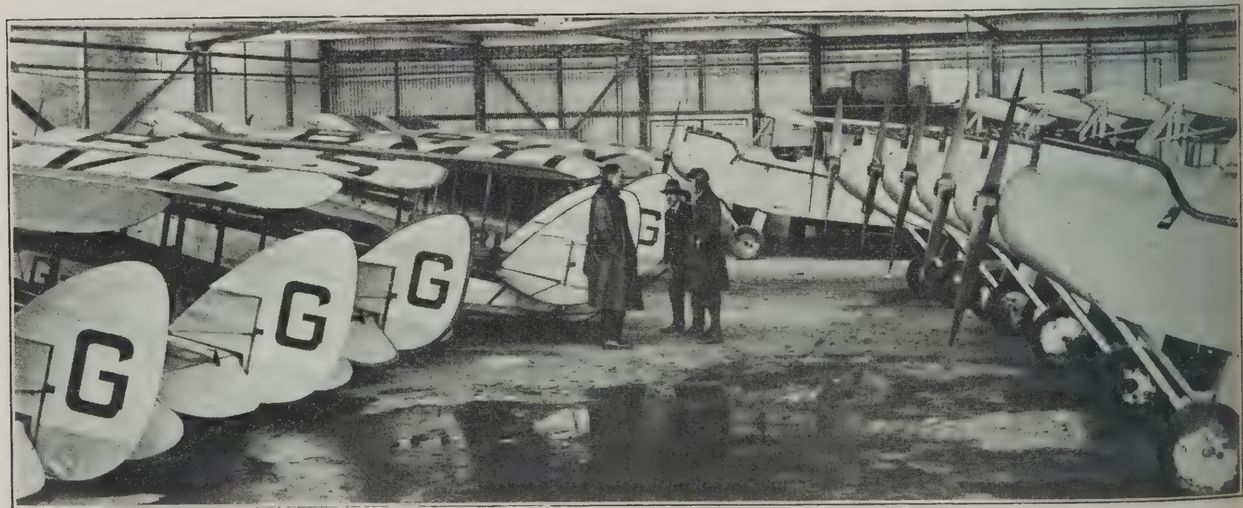
We have enough power, let us rather turn our energies to reliability.

Let the Aircraft Designer produce an efficient light aeroplane that will carry a useful load at a reasonable speed with low power, and let the Engine Designer turn his abilities to perfecting, from a reliability point of view, his already sufficiently powerful motor. This truly will be progress.

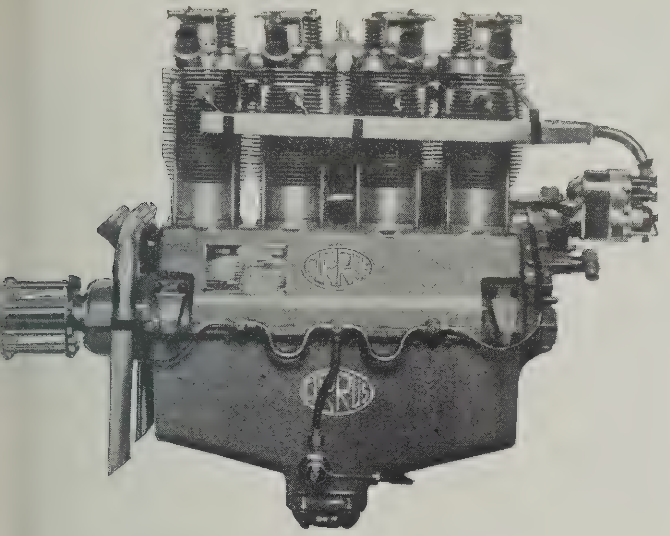
The horse-power of the light aeroplane is slowly mounting. The running costs will accordingly go steadily up. The machines will have to be built heavier and stronger until they eventually pass out of the light aeroplane class. We do not want to see this happen.

Stop at 100 h.p. Give us rather reliability in engines, and efficiency in wing and machine design.

Finish the perpetual scream for power and more power, which will surely kill the light aeroplane, and after all boils down to nothing more or less than the old principle of brute force and ignorance.



A MOTH GARAGE.—A portion of a shed at the Stag Lane aerodrome of the De Havilland Aircraft Co. Ltd. used for storing privately-owned Moths. The convenience of folding wings is clearly demonstrated.



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1st KING'S CUP AIR RACE, 1926.
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1st KING'S CUP AIR RACE, 1927.
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AERO ENGINE DEVELOPMENTS.

[*Some weeks ago an article on possible lines of development of aero-engines was published in this paper. It was intended to be provocative of debate, and did not pretend to teach,—grandmothers or others. Rather one hoped that it might fulfil the aim expresssed in the old Latin tag "fungar vice cotis," as providing a stone on which those with real knowledge might sharpen their arguments; or that it might act as the humble flint which produces sparks from steel. The article has been successful from that point of view, judging by letters and the spoken word,—frequently impolite. Among the letters of the polite kind is one from Mr. Roy Fedden, famous as the designer and producer of the Bristol Jupiter. Though it was intended to be purely personal, one has been able to get Mr. Fedden's consent to its being published. One feels that it will be of deep interest to all concerned with the use and design of aeroplanes.*—C. G. G.]

In venturing to criticise some of your suggested lines of development for aircraft engines, I want you to realise that I am trying not to be partisan from the air-cooled radial standpoint, but hope to bring to your notice certain aspects of design which you may possibly not have noted, and without in any way being personal, and being strongly in favour of your suggestion that the present technical team at the Air Ministry might be persuaded to try certain new lines of engine development, I rather doubt the soundness of some of the schemes, outlined in your article, which you are anxious to persuade them to pursue.

I attended Wing-Commander Vaughan Fowler's lecture on Aero-Engine Repairs, and I consider the most significant sentence in this lecture was "If intensive operations are long continued, the question of the repair of aero-engines being used for attack or defence may easily become of vital importance."

This sentence also calls to mind another sentence of Air Marshal Trenchard two years ago when lecturing before Cambridge University; in this case he said "In the event of another war the wastage of aeroplanes would be so great that that country which could most rapidly re-equip itself would most probably win the war."

It is the gist of these two sentences which chiefly makes me confident that the right policy, for the next few years at any rate, is to pursue the line of the air-cooled radial as the general hack engine for most types of aircraft requiring engines from 150 to 600 h.p.

Having been closely connected during the War with the production of one type of water-cooled in-line engine, and one type of air-cooled in-line engine, and having appreciated the enormous difficulties in obtaining adequate supplies of sound material, and skilled workmen to carry out the machining operations, I am convinced that, at any rate for the present, the only hope of keeping an Air Force supplied in time of war, as we know engines to-day, is the air-cooled radial,—made if possible from drop forgings, and without any castings for the stressed parts.

You state in your article that the technical people of the Air Ministry console themselves on the policy of air-cooled radials because of their lightness and climbing capabilities. I credit the technical people with more intelligence. I do not think these are the only reasons for their sticking to the air-cooled engine. I believe it is because they are sure that, at any rate for the next few years, a big war would be won or lost in the air by the air-cooled radial because of its production and repair capabilities.

With this type of engine, and the design of crank-shaft and con-rod as used on the Jupiter, all the difficulties you quote as regards main bearings are wiped away. All the main bearings can be assembled without any skilled workmanship, and different sizes of graded bearings can be kept in Stores for replacement purposes.

In your article on "Power Plant Problems" you have a good deal to say about the impossibility of jigs and hand-operated tools being carried in R.A.F. workshops near the line, with which I entirely agree. But is there any engine of the latest "vintage," except the air-cooled radial which could approach the ideal conditions you suggest?

With the air-cooled radial we are not at the present time in the state which you suggest ought to be possible for the repair and overhaul of aero-engines in the field in time of emergency. But we are already nearly there, and in a year or two we shall be able to fulfil all your requirements.

With regard to the doctrine you preached 30 years ago about the bicycle and how it has come true, I submit it has come true because the design has been simplified; stampings have been introduced universally in place of castings on the modern push-bicycle, and production costs have been cut down.

There is no type of aero-engine on the market to-day in which I can see any real hope of cutting down the price, and getting onto stampings, except the air-cooled radial.

You enlarge on the deficiencies of single-seat fighters with air-cooled radial engines, but I would remind you that some three years ago you had a good deal to say about a certain American scout which you said was 25 miles an hour faste than any of our machines.

Last March I had the opportunity of visiting one of th Pursuit Groups in America equipped with these machines and I spent a day with a man corresponding with Wing Cdr. Fowler, who is in charge of the repair of the engines an machines. He confirmed your statement as regards th speed of the machines, but stated that they were not practicable from a service and maintenance point of view.

He showed me the latest and 8th edition of this machine, and it was equipped with the despised air-cooled radial This machine was about 14 miles an hour slower than its corresponding water-cooled prototype, but he said it was "the goods" for war purposes as they had "got the bugs out of the engine and machine" from a production and maintenance point of view.

In 1926 the Single-Seat Scout Competition in France was won by a machine with a Jupiter engine in spite of very keen competition from machines fitted with Vee and Broad-arrow water-cooled engines. There was a considerable outcry as a result of this decision by the disgruntled protagonists o the water-cooled engine, and the argument was then use that owing to its higher drag the air-cooled radial single seat fighter would be at a great disadvantage in a long dive

This argument was so consistently pursued that the French Authorities carried out actual tests on an air-cooled scou versus a water-cooled Vee machine. On a dive of 10,000 fee there was very little difference in the speed. But what wa more significant was that the water-cooled machine brok up.

Obviously this does not necessarily condemn the water cooled engine, but I think you will agree it is much mor difficult to construct an aircraft which will "stay put" wit its considerably heavier weight with the water-cooled installation. Undoubtedly, as we know engines to-day, th air-cooled radial is ideal for mounting into a single-sea scout, and making the most compact and strongest type o aircraft for fighting and manœuvrability, and I am quite sur this is a most important factor.

No one is more delighted than I am that we have won th Schneider Trophy, and that some very remarkable speed have been put up last year, but I think we are some year off the Service machine doing the speeds that you conside possible. We shall do very well if we can have Servic scouts doing 200 miles an hour within the next year, and am pretty confident that Scouts with air-cooled radials wi reach these speeds this year.

A military machine has to accommodate a considerabl amount of equipment, which necessitates a fairly large body And with the modern type of air-cooled radial with a bette entry than the old blunt-nose type of engine, there is muc better chance to fair in this type of engine than previousl

I quite agree that there will be a demand for a limite number of super-fast machines operating near the groun and that these will probably be fitted with water- or stean cooled engines, but surely the biggest proportion of scout an fighting machines must have the maximum amount of clim and manœuvrability, and in this respect I am quite convinced that the super-charged air-cooled radial can give th water-cooled engine all it wants for some time to come.

In support of your views on in-line air-cooled engines, yo quote the Tiger Moth, which undoubtedly put up a remark able performance last year. But there is a very wide gu between cooling an engine of this sort, and providing for a the exigencies of Service use.

The enormous cooling effect on the Crusader with th Mercury was a revelation. And certain difficulties which w had had on the test bench with this engine entirely di appeared owing to the additional cooling we got in the ai But the cooling problems would have been very different this machine had had to fight and climb.

I believe it is absolutely necessary for a fighting engine be super-charged, and the cooling problems with supe charging are inevitably much greater.

The colossal difficulties experienced by the Grand Pr super-charged motor-cars during the last two years is a goo example. It may be possible to cool adequately a 4½ in. bo air-cooled cylinder in an in-line engine in level flight at hig speed, but to cool a 5 in. cylinder, or upwards, which is supe charged, and is not under the ideal conditions of level fligh will take some doing.

You seem very keen on the inverted Vee air-cooled i line engine, but after spending some time on its lay-out I not think it is as attractive as you think. You quote the hig rate of insurance with air-cooled radials, but surely the same remarks apply to the inverted Vee. The botto

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cylinders with their rocker-gear, etc., seem ideal for brushing off with a comparatively slight accident. The induction system with an inverted Vee is also very difficult; carburretors, etc., must be placed low, and they are therefore in a vulnerable position and bad for carburation.

There are very few in-line water-cooled engines which do not crack their crankcases. And without exception cracked crankcases on in-line water-cooled engines form a serious percentage of rejections after say 1,000 hours' running. With a large air-cooled engine there will be considerably more heat-dissipation to the crankcase, and this item will be a more serious problem to cope with than ever.

I note your remarks with interest regarding gearing, and the increased performance. The increased performance we have had with the geared engine on several machines has been most encouraging. I visualise that an air-cooled radial with all stressed parts made from drop forgings, and with three different gear-ratios for the airscrew shaft, and with three different gear-ratios for the blower, will "fill the bill" against all competitors for the next few years.

I am in agreement with your views regarding the air-cooled in-line engine for comparatively low powers and low M.E.P.s, but I think the problem is a much more serious one than you imagine. A. H. R. FEDDEN.

THE COUNCIL OF THE ROYAL AERONAUTICAL SOCIETY.

As a result of the ballot held on Mar. 27, the Council of the Royal Aeronautical Society, with which is incorporated the Institution of Aeronautical Engineers, for the year 1928-1929, consists of the following members :—

Captain P. D. Acland, Mr. M. L. Bramson, A.C.G.I., M.I.Ae.E., Mr. Griffith Brewer, F.R.Ae.S., Major J. S. Buchanan, F.R.Ae.S., A.M.I.M.E., Wing Cdr. T. R. Cave-Browne-Cave, C.B.E., A.M.I.Mech.E., A.M.I.N.A., F.R.Ae.S., Mr. A. E. L. Chorlton, C.B.E., M.Inst.C.E., M.I.Mech.E., A.F.R.Ae.S., Mr. C. R. Fairey, M.B.E., F.R.Ae.S., Captain F. T. Hill, F.R.Ae.S., M.I.Ae.E., B.Sc., Wh.Ex., Captain A. G. Lamplugh, A.F.R.Ae.S., M.I.Ae.E., Major A. R. Low, F.R.Ae.S., Mr. W. O. Manning, F.R.Ae.S., Major R. H. Mayo, O.B.E., F.R.Ae.S., Lt.-Col. J. T. C. Moore-Brabazon, M.C., F.R.Ae.S., M.I.Ae.E., M.P., Lt.-Col. M. O'Gorman, C.B., D.Sc., F.R.Ae.S., Mr. F. Handley Page, C.B.E., F.R.Ae.S., Mr. T. O. M. Sopwith, C.B.E., F.R.Ae.S., Mr. H. E. Wimperis, O.B.E., F.R.Ae.S., Mr. L. A. Wingfield, M.C., D.F.C., Mr. R. McKinnon Wood, A.M.Inst.C.E.

The Council thus shows no appreciable change in composition from the state of the Council following the amalgamation of the Society and the Institution of Aeronautical Engineers. Mr. R. McKinnon Wood, who replaces Mr. N. J. Hulbert, is the only new member.

THE ANNUAL GENERAL MEETING OF THE ROYAL AERO CLUB.

The Annual General Meeting of the Royal Aero Club was held on Mar. 22, the Chairman of the Club, Lord Thomson, presiding.

In his address the Chairman, after referring to the magnificent work of the Royal Air Force and of the British designers and constructors concerned in bringing the Schneider Trophy once more into the custody of the Club, gave a brief review of the sporting events of the year carried out under the control of the Club.

The Light Aeroplane Club movement had progressed rapidly. Instead of the six clubs existing at the beginning of 1927, there were now sixteen, with over 3,000 members receiving flying instruction. The Royal Aero Club had issued 150 Aviators' Certificates during the year, and there were now nearly 100 private owners of aeroplanes. This state of affairs was bound to give an increasing interest in Flying Meetings.

After several years of hard work at the *Federation Aeronautique Internationale*, the Club could claim credit for the initiation of the "Carnet" for touring aeroplanes. This Carnet allowed the holder to travel abroad by air without having to pay Customs dues on his machine. During 1927 the Club had issued upwards of a hundred of these Carnets to private owners of aeroplanes.

The year had been remarkable for a number of excellent flights made by British private-owner-pilots on light aeroplanes, in particular Mr. Neville Stack's and Mr. Leete's flight to India, Lt. R. R. Bentley's flight to South Africa—which had won for him the Britannia Trophy—and the flight to Australia by Mr. Lancaster and Mrs. Keith Miller.

The Club had continued its administration of the Flying Services Fund and had disbursed £627 13s. 7d. during the year to dependents of deceased airmen.

The Club Finances had improved slightly during the year, but still more members were desired.

For the coming year a programme of four official meetings to be held in the Provinces had been arranged. These would take place on May 5 at Filton, on May 28 at Hamble, on June 9 at Castle Bromwich, and on July 6 and 7 at Blackpool.

The Race for the King's Cup would be held at Hendon on July 20 and 21. It was to be a two-days' race round Britain visiting the aerodromes of the Light Aeroplane Clubs, including that of the Scottish Aeroplane Club at Glasgow.

The Aerial Derby it was hoped would be revived as a race round London in the Autumn.

The Royal Air Force had promised to support the official meetings by giving displays with Service aircraft.

Sir Charles Wakefield with his usual generosity had made contributions totalling £1,150 to the Race Fund. This sum consisted of £250 for prizes for the race for the King's Cup, £500 for the Aerial Derby, and £400 to be divided equally between the four provincial meetings.

The ballot for the filling the nine vacancies on the Committee of the Club had resulted in the election of Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Mr. R. J. Goodman Crouch, O.B.E., Lord Edward A. Grosvenor, Mr. E. J. B. How, Col. F. Lindsay-Lloyd, C.M.G., C.B.E., Lt.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lt.-Col. M. O'Gorman, C.B., Major H. A. Petre, D.S.O., M.C., and Brig.-Gen. Lord Thomson, P.C., C.B.E., D.S.O.

The Duke of Atholl, K.T., G.C.V.O., C.B., D.S.O., and the Duke of Sutherland, were unanimously re-elected as President and Vice-President respectively.

THE PARIS AERO SHOW.

The eleventh International French Aeronautical Exhibition will be held at the Grand Palais, Avenue de Champs Elysées, Paris, from June 29 to July 15.

It is being held under the auspices of the Chambre Syndicale des Industries Aeronautiques, of 9, Rue Anatole de la Forge, Paris (xvii) to whom all inquiries concerning the exhibition should be addressed.

Concurrently with the Aero Show will be held various aviation demonstrations at the several aerodromes situated in the vicinity of Paris.

"ON TO PARIS" RALLY.

The Société pour le Developpement de l'Aviation will hold its second international "Rallye Avions Paris—Vincennes" on June 30 and July 1 at the Vincennes Aerodrome.

This competition is open to all subects whose aeronautical governing body is affiliated to the F.A.I.

Competitors, who must arrive at the Vincennes Polygon between 14.30 and 15.30 hrs. on June 30, may start from anywhere, fly any type of aircraft, and carry any number of passengers, and they will be classified according to the distance flown in a straight line, their average speed, and the effective load carried in proportion to engine power, and the number of passengers carried. Additional points will be awarded to competitors arriving from countries outside France and for aircraft which are capable of landing on both land and water. Competitors arriving after 15.30 hours on June 30, or on July 1, will be penalised.

Prizes of 50,000, 30,000 and 10,000 francs will be awarded to the first three competitors, and a trophy valued at 10,000 francs will be awarded to the owner of the machine classified first.

Normal entries will be received up to 18.00 hours on May 31 and late entries at triple entrance fee up to the same hour on June 15.

A booklet, printed in five languages, has been prepared giving full details of the competition. Application for this as well as for entry forms, etc., should be addressed to the Société pour le Developpement de l'Aviation, 30, Rue Caulaincourt, Paris.

LE COUPE CECIL.

The same society is organising an international speed handicap race for the "Coupe Cecil" to be held at Vincennes on June 30.

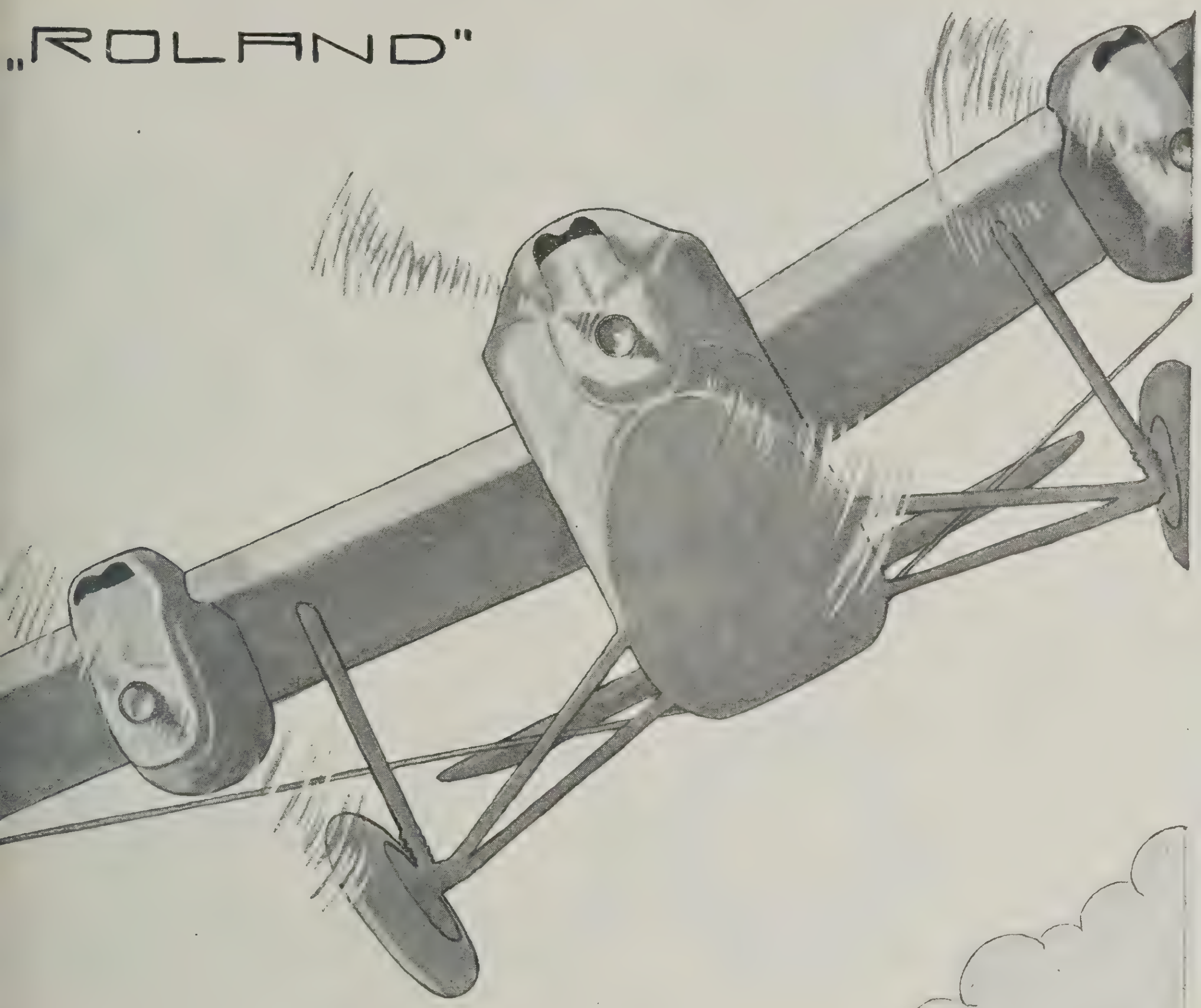
This competition will be held over the circuit : Vincennes—Le Bourget—Liege—Brussels—Antwerp — Ghent — Lille—Vincennes, with compulsory landings at Liege, Brussels and Antwerp.

Any type of aircraft may compete and competitors will start according to their handicap time, thus ensuring that the first competitors to cross the finishing line will be the winner subject to his having been observed at all the turning points.

Ten prizes ranging from 15,000 to 1,000 francs, in addition to the Coupe Cecil, which will be held for one year by the aeronautical governing body of the competitor who is classified first, will be awarded.

Normal entries will be received up to 18.00 hours on May 31 and late entries at double entrance fee up to the same hour on June 15

Applications for the five-language descriptive booklet and entry forms for the Coupe Cecil should be made to the Société pour le Developpement de l'Aviation at the above address.



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THE ROYAL AIR FORCE.

The London Gazette.

Apr. 3.

General Duties Branch.—Mate S. R. H. Davenport, R.N., is granted a temp. comn. as a Flg. Off. on attachment for four years' duty with the R.A.F. (Mar. 26). The following Plt. Offs. are promoted to the rank of Flg. Off.:—H. J. Walker (July 16, 1927); G. L. G. Richmond (Oct. 11, 1927); M. R. Edmondes (Nov. 8, 1927); A. L. Mortimer, U. S. Mackay (Jan. 10); W. T. Walton, B. W. Barton, A. R. Ward, C. E. Kay, M. M. Restell-Little, H. B. Collins (Jan. 14); H. H. Ellison, K. E. Parker, A. A. Rumsey (Jan. 17); W. G. Cheshire (Jan. 28); G. J. Powell, T. H. Downes, J. F. Moir, L. T. Carruthers, J. G. Elton (Mar. 1). The following Plt. Offs. on probation are confirmed in rank:—E. F. Shine (July 17, 1927); H. F. Suren, J. H. L. Maund, R. F. Gandy, F. J. Taylor, A. McKee, J. W. Wood, J. B. Knapp (Jan. 4); R. G. Forbes (Apr. 6).

Wing Cdr. E. L. Gossage, D.S.O., M.C., ceases to be seconded for duty at the Staff College, Camberley (Jan. 1). (Substituted for the notification in the *Gazette* of Mar. 27.)

Wing Cdr. E. R. Manning, D.S.O., M.C., is placed on the half-pay list, scale B (Apr. 1 to Aug. 31, 1928, inclusive).

The following are placed on the retired list at their own request:—Air Commodore L. E. O. Charlton, C.B., C.M.G., D.S.O. (Apr. 1); Flt. Lt. E. J. McLoughlin (Mar. 31)

A. D. Marriman, Lt. (E.), R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on return to naval duty (Mar. 26).

Stores Branch.—Plt. Off. H. M. S. Dawes is promoted to the rank of Flg. Off. with effect from Feb. 23 and with seniority of Oct. 6, 1927.

Medical Branch.—Flt. Lt. H. E. Hayes (Temp. Capt., Dental Surgeon, Gen. List) relinquishes his temp. comn. on relinquishment of his Army comn. (Mar. 11).

Reserve of Air Force Officers.—General Duties Branch.—Flt. Lt. D. Craik, D.F.C., is employed with the Regular Air Force for a period of two years (Mar. 20). The following are granted comns. in Class A.A. as Plt. Offs. on probation:—H. St. G. Burke, R. W. Burkitt, R. C. C. Gale, R. W. H. Knight, B. N. H. Thornely (Mar. 15); W. E. Hampton, P. G. Philcox, A. N. Spottiswoode (Mar. 19); L. C. Williams (Mar. 20). Flt. Lt. A. G. Taylor, A.F.C., is transferred from Class A to Class C (Feb. 23); Flg. Off. R. F. Cathrow is transferred from Class B to Class C (Feb. 5). The following Flg. Offs. relinquish their comns. on completion of service:—C. T. S. Capel, M.B.E. (Sept. 18, 1927); R. P. Whyte (Jan. 6).

Medical Branch.—Hon. Flt. Lt. W. G. Weston, M.B., is promoted to the rank of Hon. Squadron Leader (Apr. 3).

Appointments.

General Duties Branch.—Squadron Leaders J. Leacroft, M.C., to No. 3 F.T.S., Grantham, 1/4. J. C. P. Wood, to No. 101 Sqdn., Bircham Newton, 28/3. G. B. A. Baker, M.C., to No. 4 F.T.S., Egypt, 15/3. A. S. Maskell, to No. 3 F.T.S., Grantham, 24/3.

Flight Lieutenants C. C. Bazell, to Home Aircraft Depot, Henlow, 28/3. J. N. D. Anderson, to No. 407 Flight, Donibristle, 20/3. J. L. M. de C. Hughes-Chamberlain, to Fighting Area H.Q., Uxbridge, 5/4.

Flying Officers E. H. M. David, to No. 5 F.T.S., Sealand, 21/3. H. E. Rew, to School of Army Co-operation, Old Sarum, 22/3. C. H. Morgan, to R.A.F. Depot, Egypt, 11/3. J. R. Addams, to No. 22 Sqdn., Martlesham Heath, 1/4. J. W. Duggan, to No. 101 Sqdn., Bircham Newton, 2/4.

Pilot Officers J. G. Elton, to No. 101 Sqdn., Bircham Newton, 2/4. The undermentioned Pilot Officers are posted to No. 5 F.T.S., Sealand, with effect from 27/3:—G. F. Simond, J. A. G. Baker, H. M. S. Barnard, M. I. Barnett, J. Beaumont, F. A. R. Bishop, B. S. Bramble, W. E. Catling, R. Chadwick, R. D. Cotton, W. J. Crisham, R. S. Darbyshire, F. P. Donovan, H. J. Forster, F. C. G. Freeman, O. V. Garratt, O. I. Gilson, E. S. Greenwood, A. N. E. Hall, C. P. Hanlon, J. A. Harris, B. W. C. E. Hartwell, E. G. Hitchings, T. R. Hope, H. T. Lines, V. B. Lintott, J. H. Lock, E. D. Mills, R. Mountain, V. H. Nicolay, J. S. Pole, G. E. F. Proctor, J. B. W. Pugh, C. H. Robbins, N. X. Sheldrick, L. H. Snelling, F. B. Taylor, D. Timms, J. G. Walling, R. F. Williams, R. F. A. W. Williams.

Medical Branch.—Flight Lieutenant H. W. Corner, M.B., to R.A.F. Hospital, Cranwell, 12/4.

Accountant Branch.—Flight Lieutenants W. J. Heneghan, to No. 3 F.T.S., Grantham, 27/3. P. Hay, M.C., to No. 1 Air Defence Group H.Q., 26/3.

Flying Officers J. J. T. Rose, to No. 4 F.T.S., Egypt, 8/3. R. W. Collinson, to No. 216 Sqdn., Egypt, 15/3. C. F. Goatcher, to No. 2 Armoured Car Coy., Middle East, 9/3.

An Award.

The London Gazette of Apr. 3 states:—

The King has approved of the following award in recognition of gallant and distinguished service in 'Iraq:—

Distinguished Service Order.—Flt. Lt. J. F. T. Barrett, D.F.C.

A *Reuter* message from Baghdad dated Apr. 2 describes the incident which earned this award as follows:—

Flt. Lt. J. F. T. Barrett, D.F.C., of No. 84 (Bombing) Squadron, has been awarded the Distinguished Service Order for conspicuous gallantry in operations against the Akhwan.

A brother officer's machine had been compelled to land near hostile tribesmen owing to engine failure.

Flt. Lt. Barrett, without a moment's hesitation, although in danger himself of being killed or captured, swooped down, landed alongside, picked up his friend, and carried him to safety.

When he took off with the rescued officer they were only 400 yards from the tribesmen, who had opened heavy fire on the machines.

The 1928 Cairo—Cape Town Flight.

The annual Service flight under the command of Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., which left Heliopolis on Mar. 1 and reached Cape Town on Mar. 24, arrived at Durban on their return journey on Apr. 2.

The Flight arrived at Pretoria on Apr. 6 accompanied by four machines of the South African Air Force which will fly with them to Khartum.

The fourth R.A.F. machine which was damaged at Bwana Mkubwa, in Northern Rhodesia, is being repaired there.

Air Operations in Arabia.

The Times correspondent at Aden in a message dated Apr. 2 states:—

The bombing of Kataba by British aeroplanes, reported on Mar. 5, continued with intervals until Mar. 22, when news was received here that the Zaidi Imam of Sana' had decided to yield to the British demands and surrender the Alawi Sheikh of El Kasha and his uncle, the Kotaibi Sheikh of Jemil, who had been kidnapped from inside the British Protectorate by Zaidi raiders. The two prisoners returned on Mar. 24 bearing a request from the Zaidi Imam for a truce, which has now been granted.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident near Colchester to a Bristol Fighter machine of No. 2 (A.C.) Sqdn. Manston, on Apr. 2, Flg. Off. Jack Hadden (Lieut. Black Watch), the pilot of the aircraft, and 370079 AC.1. George Henry Towers, were killed.

The Air Ministry regrets to announce that as the result of an accident near Hillah, 'Iraq, to a D.H.9a machine of No. 30 (Bombing) Sqdn., Hinaidi, 'Iraq, on Apr. 2, 1928, Plt. Off. Jack Whitworth Wood, the pilot of the aircraft, and 358180 AC.1. William Waugh, were killed.

The Air Ministry regrets to announce that as the result of an accident at Hong Kong to a Fairey III.F machine of No. 440 (Fleet Spotter Reconnaissance) Flight, H.M.S. *Hermes*, on Apr. 3, Flg. Off. Alfred William Beverley Hale, R.A.F., the pilot of the aircraft, and the passengers, Lieut. John Henry Patrick Graham, R.N., and J.77956 Telegraphist Stanley Jackson were killed.

At the inquest at Colchester on Apr. 4 on the bodies of Flg. Off. J. Hadden and AC. G. H. Towers, Flg. Off. E. G. C. Stokes said that on Monday morning Hadden and Towers went up to make an aircraft attack on troops of The Suffolk Regiment on the march along the road towards Old Heath. It was Hadden's duty to fly over and dive on the troops and "shoot at them." He was then to swoop up and get away before they could retaliate. After the wing was broken by striking a tree it would smash the control devices and put the plane out of control. He also said that there were definite orders that a man must not fly below 1,000 ft. unless there was a field nearby

THE FAR EAST FLIGHT.—The four Supermarine Southamptons (two Napier Lion engines) of the Far East Flight, R.A.F., at Singapore.

VIAN PRICE REDUCED

The price of the Avro Cirrus-Avian
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to land in. He added that they were not over the town but on the outskirts.

The jury returned a verdict that the men were killed by the aircraft nose-diving after striking a tree, and it was accidental. They considered that representations should be made to the military authorities to prevent aircraft manœurving so low near a town.

A Fatal Accident in Ulster.

An accident at Dunmurray, near Lisburn, on Apr. 5 to an aeroplane of No. 502 (Ulster) (Bombing) Squadron, R.A.F., Special Reserve, resulted in the death of a child who was playing in the village. The pilot, Flg. Off. J. S. Davidson, was seriously injured.

At the inquest on the child on Apr. 6, the July returned a verdict of accidental death and added a rider condemning air evolutions over the village.

Witnesses stated that after looping the loop the machine descended, and, when flying low, suddenly crashed on to the roof of a house. One wing and the engine fell to the ground, but no one saw the child until her body was discovered under the wreckage.

Wing Cdr. A. C. Wright, A.F.C., R.A.F., said that the Air Ministry would hold a thorough investigation into the matter.

Parachute Escapes.

On Apr. 3 Flg. Off. V. O. Eyre, of No. 56 (Fighter) Squadron, was flying over Essex when he unstrapped his belt to retrieve a map which had fallen to the floor of the cockpit. While bending down his machine, a Siskin, turned over and the pilot fell out. He pulled the ring of his parachute and made a safe landing.

Another Siskin of No. 56 (Fighter) Squadron, R.A.F., was wrecked on Apr. 7 while co-operating with the Essex Group of Searchlight Companies in night-flying operations over Brentwood. The pilot, Sjt. Pilot Trout, escaped with his parachute.

Fighting Night-Bombers.

Some interest seems to have been caused by the fact that certain recent variants of by no means recent night-bombers, and some of our new flying-boats, are to have gun-pits behind their tail-planes, so that fire can be brought to bear on attacking machines whose pilots hope to find cover behind the tails of the big machines. This arrangement is hailed as a novelty.

As a matter of fact it was a standard fitting in the Handley Page four-engined V/1500 type, which was built late in the War 1914-18. And that well-known pioneer Mr. Alec Ogilvie owes his life to the fact that he, then serving in the R.A.F., was pitched out of the tail gun-pit of a V/1500 which crashed and caught fire near Golders Green, when all the rest of the crew, in the forward part, were killed.

A Mr. Chessborough J. Mackenzie-Kennedy, who built at Northolt during the war a colossal machine which never flew, claimed vast rewards from the British Treasury for having invented the idea of the tail gun-pit, which was never used in the war. He failed to convince the Commission for Awards to Inventors of the value received by the Empire from his idea.

Air Commodore Charlton.

Air Commodore L. E. O. Charlton, C.B., C.M.G., D.S.O., who is announced in *The London Gazette* of Apr. 3 to have been placed on the retired list at his own request on Apr. 1, was born in 1879 in London, and was educated at Brighton College. He was gazetted to The Lancashire Fusiliers in 1898. In 1901 he was attached to the Imperial Yeomanry. He fought in the South African War and was made a Companion of the Distinguished Service Order. He was seconded to the West African Frontier Force in 1902, and served with it until 1907. In 1908 he was appointed Aide-de-Camp to the Governor of the Leeward Islands. He learned to fly on a Bristol biplane at Brooklands and his Royal Aero Club Certificate, No. 609, is dated Aug. 29, 1913. He was seconded to the Royal Flying Corps in 1914 and went overseas with No. 3 Squadron on Aug. 13, 1914. In September, 1914, he was promoted to be Squadron Commander. He was promoted Major in The Lancashire Fusiliers in September, 1915, and Lieutenant-Colonel, R.F.C., at the end of 1915. In March, 1916, he was appointed G.S.O.1. and in February, 1917, he became a Director, War Office, with the temporary rank of Brigadier-General. In August, 1919, he resigned his commission in The Lancashire Fusiliers on appointment to a regular commission in the R.A.F., with the rank of Air Commodore. He was made a Companion of the Order of St. Michael and St. George in 1916, and a Commander of the Order of the Bath in 1919. He was appointed Air Attaché to the British Embassy at Washington in February, 1919, and in 1923 he was posted to H.Q., 'Iraq Command, for duty as Chief Staff Officer. He commanded No. 3 Group at Spittlegate in 1924 and was appointed to the Department of the Air Member for Supply and Research, Air Ministry, in 1925.

THE WAHABI WAR IN FACT.

Now that the Air Ministry has announced the appointment of Flt. Lt. Barrett to be a Companion of the Distinguished Service Order one is at liberty to make public certain facts about the Wahabi War which have not been published.

The newspaper reports from 'Iraq are so meagre and so inaccurate that few realise how difficult is the task of the R.A.F. Most people, even in the R.A.F., seem to think that the Air Force merely dashes out over the desert, machine-guns a few " Buddoos " on camels, and comes home to lunch. The facts are very different, as may be judged from the following extracts from a letter written by an officer of the R.A.F., an experienced desert campaigner himself, who left the Service a few years ago, and, lately made a business tour of Palestine and 'Iraq where he found himself among old friends and so got the true story of this minor war.

Writing in February last he says :—" Now for the Shaiba news and the war with ed Dowish. This show is really nasty. He runs a gang of 2,500 well-trained raiders, and all very good shots. So far he has shot down three people with direct hits in the radiator.

" Sq. Ldr. Vincent was the first, and *he* got away with it. Jackson was the next. He was hit in the radiator and came down right in the middle of them. Tried to scrap them with his revolver but was killed,—one in the head and the other in the heart. He was found later, stripped but not mutilated.

" Next young Kellett was shot down in the same way, but landed over a ridge out of sight. He got away with both his locks and bolts out of the guns, and collected all his ammunition before they appeared.

" Things would have been pretty bad only Flt. Lt. Barrett landed and picked him up. That is the second time that Barrett has landed under fire and picked up people in the week. He has put up a wonderful show and is up for a decoration.

" Our people dare not fly below 3,000 ft. now, as they are shot up at once. Every reconnaissance comes back riddled.

" Only four days ago ed Dowish and his army were within 30 miles of Shaiba, with our armoured cars in front and behind him, ... but he slipped away in the night.

" They got him the day before yesterday O.K. [Feb. 24]. They knew all the time that he always went back to a place 350 miles from Shaiba to share out the loot after a raid. They went out to the advanced base and flew 150 miles over hostile territory and foul country and bombed him up.

" Two Vickers went with four 500 pounders, and nine gas with Coopers. The photographs were good and they know that one 500 pounder got one lot of sixty. They bombed the fort with the big stuff, and they all ran out and met the Coopers outside.

" The Wahabis are plucky devils. Bill Fenwick met two the other day out in the blue. He had four armoured cars with him, and these two fellows scrapped them, if you please. One was killed, and his pal leapt off his camel, picked up his ammunition and rifle, and went on scrapping until he was shot through both knees. Two men against four armoured cars,—can you beat it?

" Dowish is playing merry hell all over. He has been down to Koweit and raided,—and now there are two cruisers lying off, protecting the place. We are starting operations from there.

" Dowish paid a flying visit to Transjordan when I was in Jerusalem, and played hell with the Beni Sakhr tribe. Shot them to bits, and then went back to round Shaiba.

" Things in 'Iraq are very different now [" from my time " (understood)]. It is 'Iraq for the 'Iraquis, and to Hell with the British. People tell me that they are worse than the Gippies—and they have learnt it all in eighteen months. There are no troops at all. Dowish could have come right into Basra the other day, and he could easily wipe up Shaiba if he wanted to. There's no one to stop him.

" All the tribes are just waiting for us to move into Baghdad [After closing down the R.A.F. stations at Mosul, Kirkuk, and Shaiba] and then the trouble will start. They are expecting a hell of a row. The whole thing is that no one will ever recognise Feisal as King, especially the people up North in Kurdistan. I fully expect to see another 1920 rebellion, only worse."

The story of the fighting between the R.A.F. and the Wahabis is at any rate interesting and informative. Aircraft are not so all-powerful over scattered troops on the ground as might be imagined. Students of the next war will do well to revise their ideas of strategy ad tactics accordingly.

As to the political situation in 'Iraq,—we see again the folly of these " Mandated Territories," which we are supposed to protect while the people are allowed to misgovern themselves. One regrets more and more the expansive days of Queen Victoria when our Government governed, and when we British people took to ourselves as Imperial possessions, for the good of the native populations, such territory as seemed good to us.—C. G. G.

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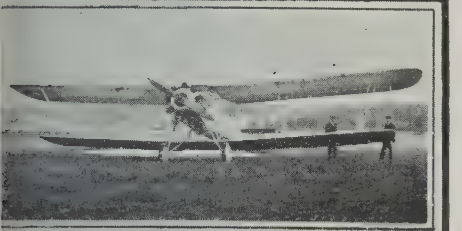

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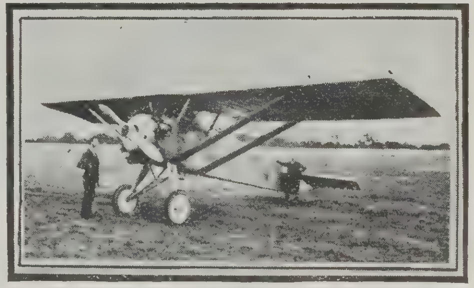

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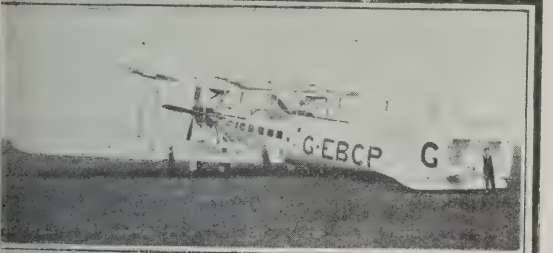

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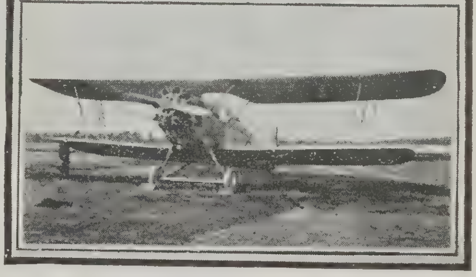

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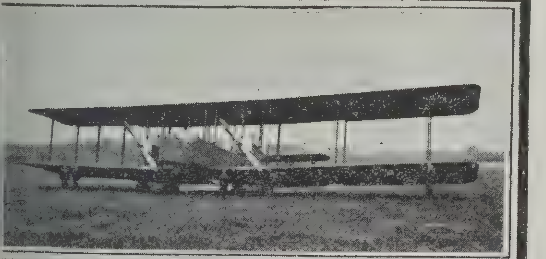

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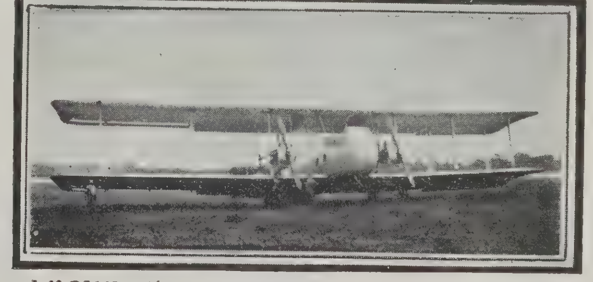

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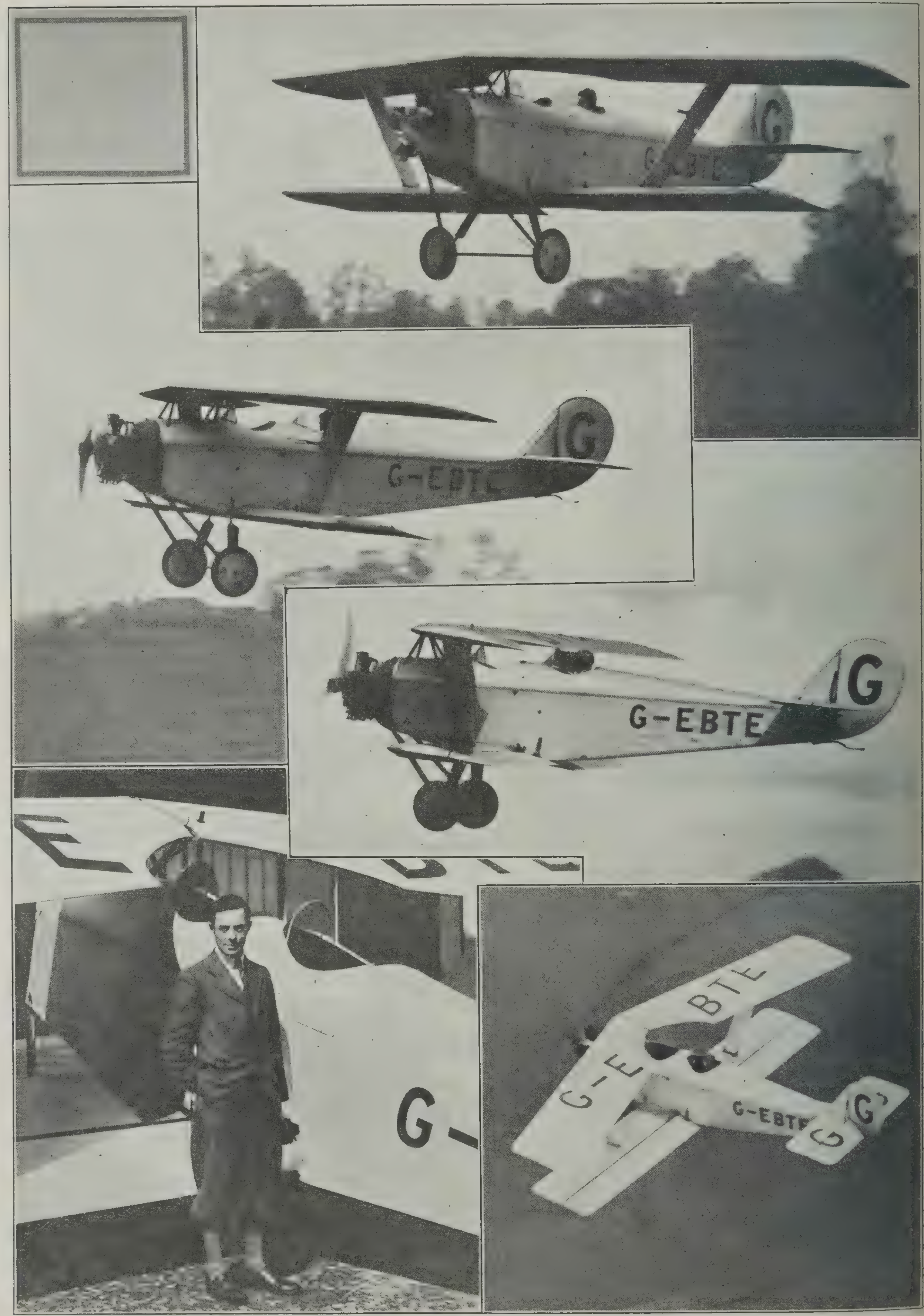

THE LATEST LIGHT AEROPLANE.—Various views of the Imp, the new light aeroplane built by Geo. Parnall and Co., of Yate, Bristol, piloted by Mr. Harold Bolas, its designer, who is seen in the bottom left-hand corner picture. All views show the excellent vision which is obtained from both seats. The engine is a 65 h.p. Armstrong-Siddeley Genet air-cooled radial.—(*"Aeroplane" photographs.*)

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EASTER MEETINGS.

LYMPNE AGAIN.

Personally one always goes to a Lympne flying meeting with a marked prejudice in its favour. In the first place there is a delightful drive from London along one of the best and broadest roads in England. The aerodrome has pleasing surroundings, and there are pleasant memories of past meetings. And then again it makes such a good excuse to go and stay at that most expensive Grand Hotel at Folkestone

Unfortunately, owing to there being an international hockey festival in Folkestone during Easter very few people were able to enter the sacred portals of the Grand. Many people, including the De Havilland fraternity, went to the Royal Oak at the Lympne cross-roads. It is understood that they used great discretion when speaking to the leader of the orchestra. They never called him a —— or an ——, or any other of those pet names which so hurt the feelings of the Navy.

The Cinque Ports Flying Club are certainly to be congratulated on their first effort at running a flying meeting. It was not a perfect meeting, and no doubt they will profit from their experience in the future, but the organising committee and the energetic Mr. Dallas Brett, who as Clerk of the Course never seemed to stop running, are to be congratulated on a distinct success.

Perhaps one may offer a word of criticism. One of the most pleasant features of any flying meeting is the fact that one can use one's car as a grandstand. One can watch the flying from it, and if the weather is cold, as it was on Saturday, one can keep warm in it. If one wants to find one's friends one can trace them by their cars.

Therefore it was most irritating to have to park cars in the sheds. It was bitterly cold in the enclosures, and this fact made people somewhat impatient, and sent many of them away with an idea that the show was less good than it was. In future the committee at Lympne and at other aerodromes must see to it that there is a car enclosure from which one can watch the flying.

Secondly, there must be more actually flying races. There are several good short courses at Lympne round which the machines are in view from the enclosure the whole time. And it is an undoubted fact that the public are more thrilled by a close finish in a race than they are by a close shave in a stunting exhibition.—G. D.

GOOD FRIDAY.

The flying on Good Friday, which was blessed with perfect weather, was attended by a very much larger crowd of the general public than ever attended the Royal Aero Club's meetings at Lympne. Over twenty light aeroplanes of different types arrived, most of them belonging to private owners.

The events on the programme consisted of "Joyriding" and "Aerobatics" alternately, but so far as one could see joyriding was continuous throughout the afternoon. The public certainly had "that flying feeling," for between 2 and 6 p.m. 122 passengers were taken up at 5s. each.

Very good displays of aerobatics were given by Flg. Off. Kirsten, Mr. Broad and Mr. Stack on Moths, and Flt. Lt. Luxmoore on an Avian. A Grebe from No. 25 Squadron piloted by Sq. Ldr. W. H. Park, M.C., D.F.C., visited the meeting and gave a first-class exhibition of aerobatics.

The arrival of Plt. Off. Cousins on a D.H.53 caused much amusement, to those who managed to get a good view of the aerodrome, by flying along the front of the enclosure a few feet from the ground, politely raising his bowler hat to the crowd.

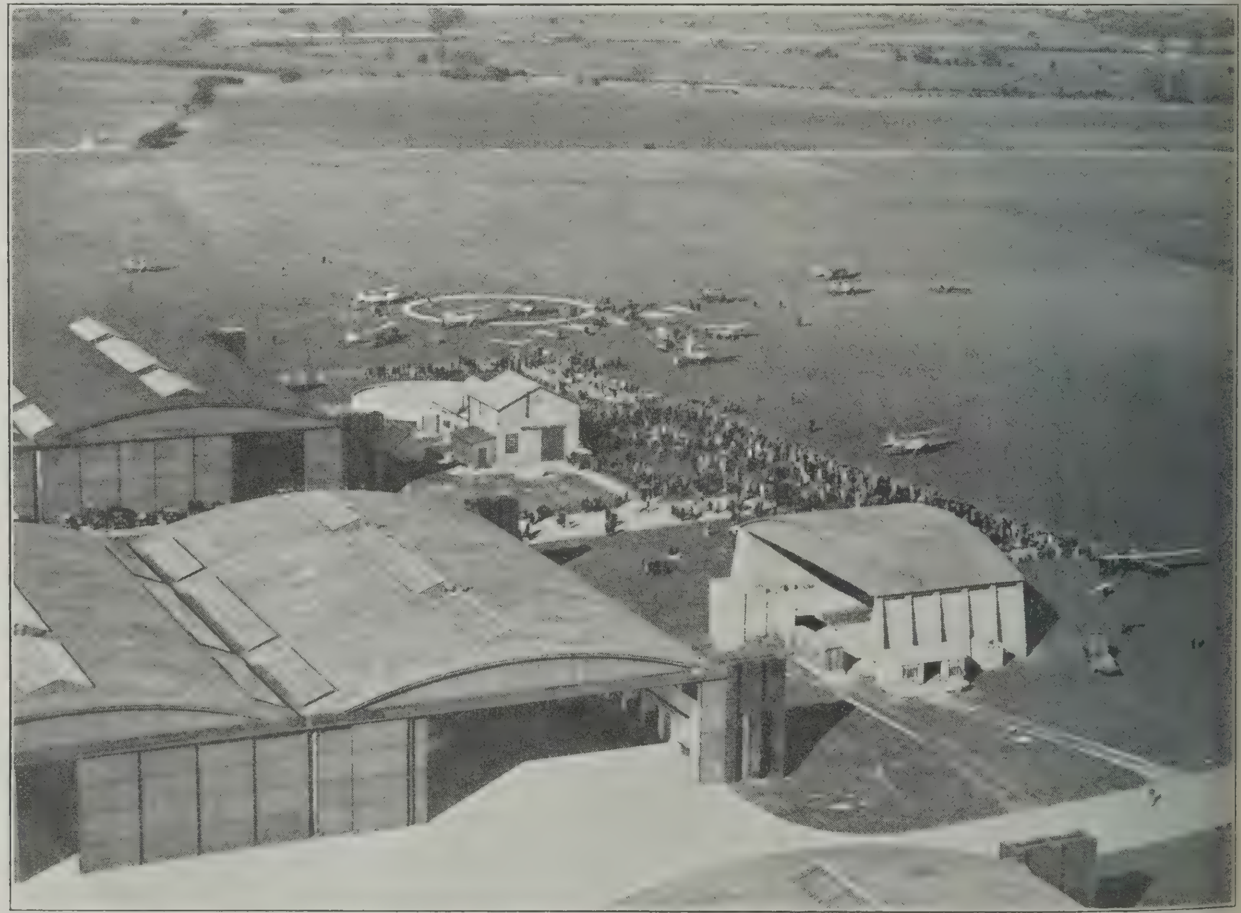
Altogether the afternoon's flying was worth very much more than the sixpence charged for admission. Any one of the exhibitions of aerobatics alone was worth more than that.—M. H.

SATURDAY.

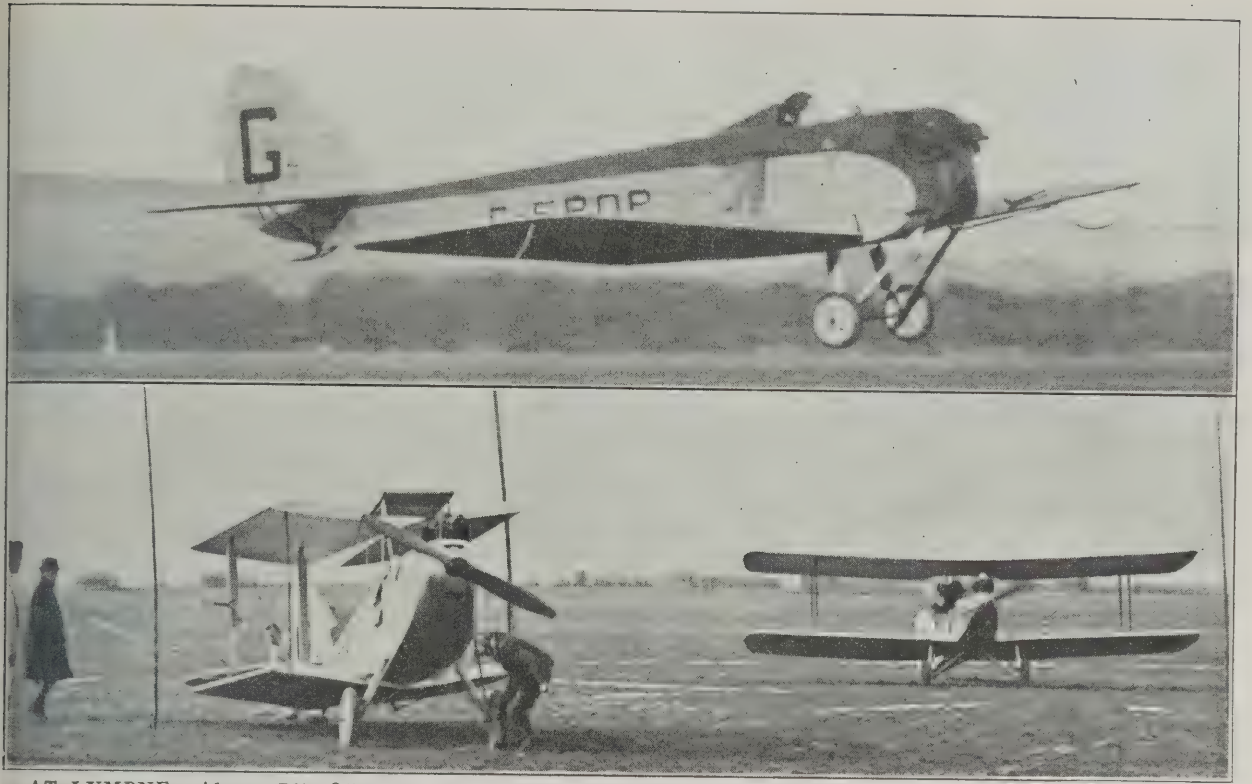
When one arrived at Lympne on Saturday morning there was a big crowd of all sorts of aeroplanes.

There were no less than 19 private owners of modern light aeroplanes down on the programme as appearing, and at least a dozen more turned up unofficially. Many of these came in their aeroplanes to watch the flying, as people go to Brooklands in their cars to watch the motoring (or at least so much of the motoring as it is possible to see from the general lay-out of Brooklands).

Mr. Nigel Norman, who was there, will go down to history as the first private owner of an aeroplane with slotted wings. He is a Flying Officer in Sq. Ldr. Lord Edward Grosvenor's 601 County of London Auxiliary Squadron. He has just taken delivery of a slotted Moth. He came over on this machine with Doctor Whitehead Reid, also now a Flying Officer in 601 Squadron, as passenger. The latter has got the first experimental Genet-Widgeon, which is very



LYMPNE.—An aerial view of the first Cinque Ports Flying Club meeting at Lympne. This photograph was taken from a D.H. Moth piloted by Mr. T. Neville Stack.—(*"Aeroplane" photograph.*)



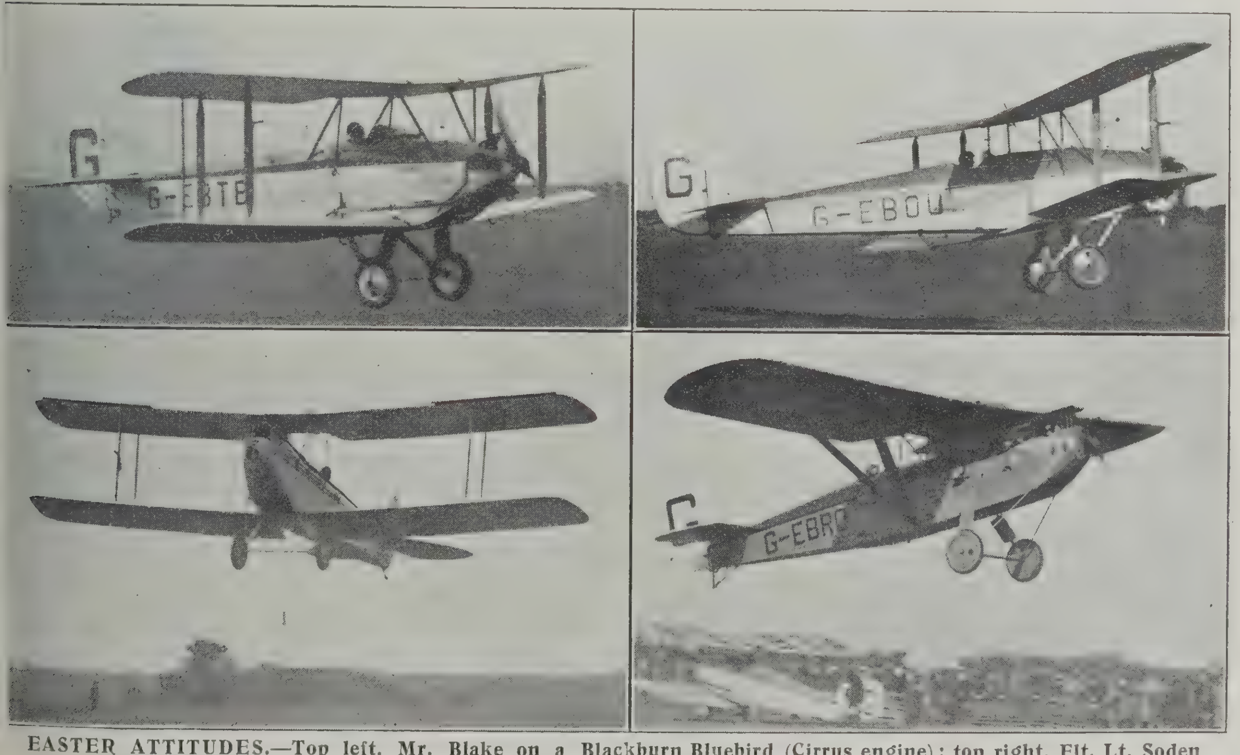
AT LYMPNE.—Above, Plt. Off. Cousins on the D.H.53 (Cherub engine) without his bowler hat, and below, Mr. Hubert Broad in the process of winning the folding and erecting race.—(*"Aeroplane" photographs.*)

ch lighter than the Standard Widgeon, and consequently rather easily blown over in such a high wind as was owing on Saturday. Therefore he left it at home. He has eady had it blown over once, and it took some six weeks repair.

uring the whole of the two days two Avros of the Henrson Flying School, under the command of Mr. Jock derson, were joy-riding, piloted by Messrs. Davis and lds. Mr. Anderson, who was for some years with the rrey Flying Services, is now in charge of the Henderson hool at Brooklands, which is running with high efficiency. he first item on the programme on Saturday was a disy by Flg. Off. S. S. Kirsten, on a Moth, which was remely pretty to watch. About the same time Sq. Ldr. England demonstrated that sinking feeling on a slotted Moth.

Much amusement was caused by the arrival of Plt. Off. Cousins, in a D.H.53 from Manston, wearing a bowler hat and carrying an umbrella. As he flew past the enclosure he raised his bowler to the crowd and waved his umbrella. This demonstration was intended as an antidote to the arctic clothing worn by some pilots of aeroplanes, motor-cars and motor-cycles.

The afternoon's proceedings began with a manufacturers' folding and erecting race, in which competitors were lined up with their engines stopped. On the signal to go competitors had to start their engines and fly round the funny sugar loaf-shaped hill on the way to Folkestone and back:



EASTER ATTITUDES.—Top left, Mr. Blake on a Blackburn Bluebird (Cirrus engine); top right, Flt. Lt. Soden on a D.H. Moth (Genet engine); bottom left, Sq. Ldr. England on a slotted Moth (Cirrus engine), and bottom right, Plt. Off. Penrose on a Westland Widgeon (Cirrus engine).—(*"Aeroplane" photographs.*)

to the aerodrome. Here they had to land and taxi to the enclosure, fold their machine and push it between two posts, re-erect the machine, fly the same circuit, and the first machine to cross the finishing line was the winner.

There were three starters, Mr. Broad on a Moth, Mr. Lines on an Avian, and Mr. Blake on a Bluebird. Mr. Broad took the lead at once, and as he was coming down to land his passenger climbed out on to the wing and started folding operations, with the result that when the machine came to a standstill one wing was practically folded! In a few seconds the machine was through the posts and was being re-erected. The other two competitors apparently considered that Mr. Broad's outfit was too superior to theirs to continue, and so they retired from the fray, leaving Mr. Broad the winner. It was very unfair of the other two to the makers of the Avian and the Bluebird to withdraw, and it altogether spoilt the event.

By the time several other machines had joined in the joy-riding and even then there were more passengers than could be handled. It would certainly have paid Imperial Airways Ltd. to have sent down a big machine as they did last year.

Mr. Neville Stack, who had been joy-riding the previous day with a Moth, arrived for the same purpose armed with a D.H.9. Up to now we have always looked upon a D.H.9 as a small and handy sort of aeroplane. But Moths and things have evidently changed our ideas, for the 9 looked an enormous craft among the other machines.

At 4 p.m. there was a height guessing contest. A Moth ascended, and at a secret height fired Verey lights. The spectators had to fill in on cards bought for sixpence how high they estimated the machine to be when the aforesaid fireworks went off. Personally one thought one was very clever getting within 400 ft. of the correct height, especially as no one knew whether they had to guess the height above the aerodrome or above sea-level.

The final competitive event was a relay race for all sorts of transport. Pilots first had to run 100 yards, then cycle 100 yards, motor ¼ of a mile, and finally start up their engines and fly to the Sugar Loaf Hill and back.

The running 100 yards seemed to scare most people. Sq. Ldr. England tried to bribe one to do his running However, one felt that it would be too difficult to get one's figure up to the girth of Sq. Ldr. England's, so as to render a sufficiently colourable imitation, and so one had to decline.

Mr. R. Malcolm, who has succeeded Mr. R. A. Loader at De Havillands, and who is largely gifted with avoirdupois, used the De Havilland Moth Service lorry as his motor-car, as it was not thought fair to either motor-car or aerodrome to take him a quarter of a mile across the aerodrome.

The race resulted in a close finish, in which Sq. Ldr. England beat Mr. Broad on the post.

So ended the first Cinque Ports meeting, and one hopes there will be many more, but we *must* have a car enclosure next time. That is absolutely essential.

There was an air of quiet over the whole proceedings, which was accounted for by the absence of Harold the Hearty and his latest Spring Voice and Suiting. Our gain, however, was probably some harmless, unsuspecting golf club's loss. The lack of colour was more than made up for by the variegated colours of the aeroplanes, and Mr. Norman Jones, with his awful maroon and yellow Moth, which was an admirable substitute for Mr. Perrin's plus fours, deserves special censure.—G. D.

THE HADLEIGH MEETING.

The Meeting organised by the Suffolk Aeroplane Club took place on Sunday and Monday, Apr. 8-9, in fine weather.

Proceedings began at 10.30 hours with a demonstration flight by two Blackburn Bluebirds flown by Mr. Courtney Prentice, Hon. Secretary of the Suffolk Club, and Mr. G. E. Lowdell, A.F.M., the Instructor of the Club.

The next event on the programme was the "On to Hadleigh" Rally. In this contest competitors chose their own starting point and were required to arrive at Hadleigh as near as possible to 11.30 hours. The distance in miles flown to Hadleigh divided by the minutes between the actual time of crossing the finishing line in flight and 11.30 hours, the "Zero" hour, decided the number of points to be awarded to each competitor. The first to arrive was Mr. R. G. Cazalet on a Westland Widgeon from Castle Bromwich who landed 15 secs. before 11.30 hours. He carried Flt. Lt. Rose, the instructor of the Midland Club, as passenger. The next to arrive was Mr. Blake, the Blackburn company's test pilot, on a Bluebird from Lympne, and Mr. Norman Jones and Mr. Nigel Norman, both on D.H. Moths and both flying from Lympne, tied for third place.

At 10.00 hours Miss Sylvia Edwards, of Halesworth, the first woman flying member of the Suffolk Club, arrived at the aerodrome towing a Blackburn Bluebird behind her motor-car. She thereupon uncoupled and unfolded her machine and made a short flight round the precincts of the aerodrome.

At 12.30 hrs. Mr. Lowdell gave a very convincing display of upside-down flying on one of the Club's Blackburn Bluebirds.

From 12.30 hrs. and throughout the afternoon various machines were carrying a continuous stream of joy-riders at 5s. per flight. At the express desire of certain local religious bodies the Club had agreed that there should be no joy-

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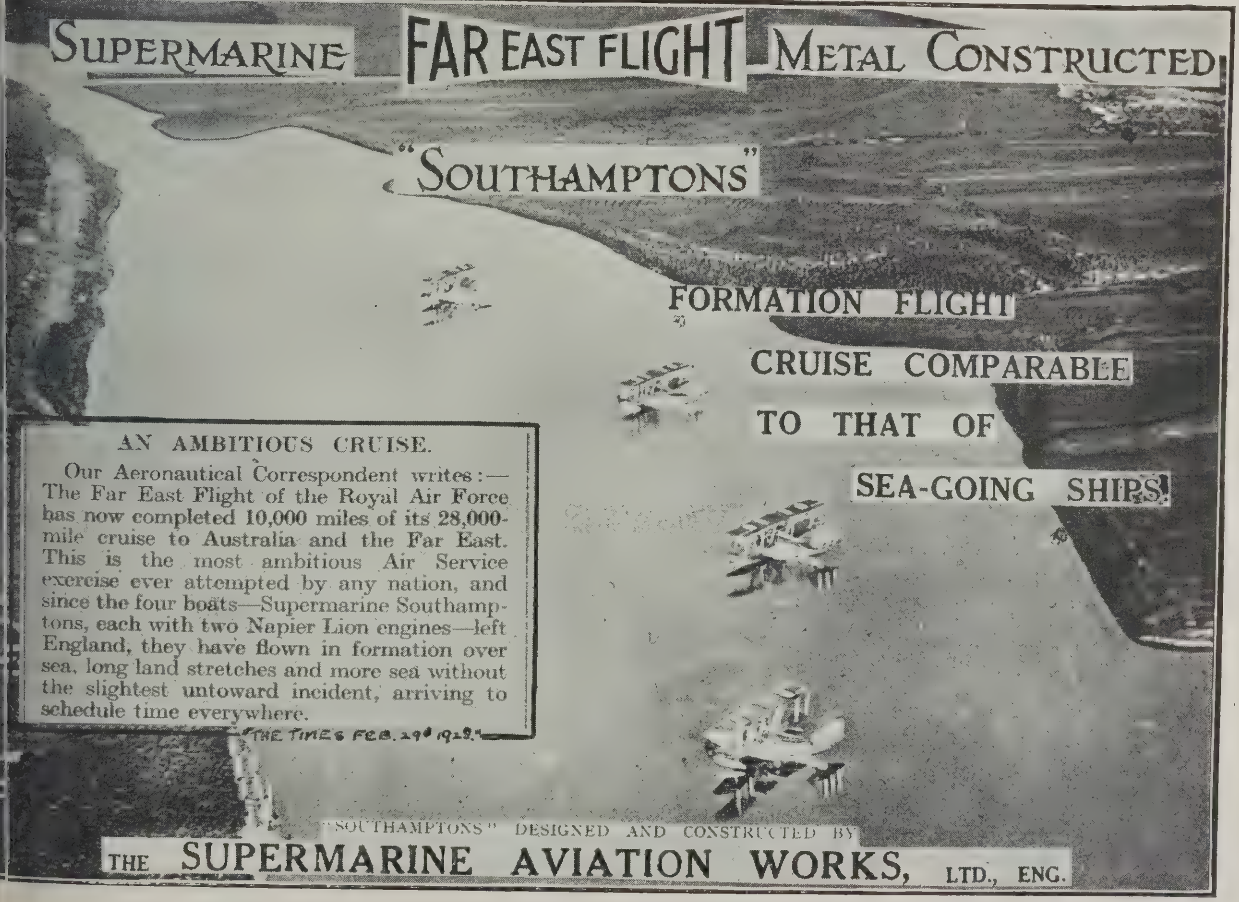

AN AMBITIOUS CRUISE.

Our Aeronautical Correspondent writes:—The Far East Flight of the Royal Air Force has now completed 10,000 miles of its 28,000-mile cruise to Australia and the Far East. This is the most ambitious Air Service exercise ever attempted by any nation, and since the four boats—Supermarine Southamptons, each with two Napier Lion engines—left England, they have flown in formation over sea, long land stretches and more sea without the slightest untoward incident, arriving to schedule time everywhere.

"THE TIMES FEB. 29th 1928."

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riding during the recognised hours of service on Easter Sunday morning.

At 16.30 hours Sq. Ldr. T. H. England gave a demonstration of flying on a D.H. Moth fitted with slots.

At 17.00 hours four Blackburn Bluebirds flown by Mr. Courtney Prentice, Mr. Lowdell, Mr. Blake and Mr. Billinton, gave a demonstration of formation flying.

On Easter Monday joy-riding, interspersed with exhibition flights and demonstrations occupied the morning. The afternoon proceedings opened at 14.00 hours with a Parade and Fly-past of all the machines present. At 14.30 hours Mr. Lowdell repeated his display of upside-down flying.

The event of the afternoon was the Suffolk Handicap Race, flown round two circuits of a 20-mile course. The winner of this was Miss Spooner of the London Flying Club on a Mark I Moth, who, starting first with a total handicap of 4 mins. 5 seconds, was never caught. Mr. Neville Stack on a Moth was second, and Mr. White on another Moth third.

At 15.45 hours a " Pageant of Travel " showing first an ancient Briton astride a wooden ancestor of a cycle, then a medieval woman on horseback, a lady on a "penny farthing" a bicycle, a motor-car, and finally a light aeroplane, was staged.

A variant of the familiar bomb-dropping competition—labelled Aerial Golf—came next. Competitors—each armed with three bags of flour—had to attempt to drop their " bombs " into, or onto a " hole " marked by a flag. Flt. Lt. Rose of the Midland Aero Club got to within five feet of the " hole " and collected the Suffolk Easter Trophy.

Another amusing event consisted of an attempt by Mr. Lowdell, on a Blackburn Bluebird, to " bomb " an Austin Seven motor-car with bags of flour. Although no actual hits were recorded there were many misses of but a few feet.

Thereafter Lady Leucha Warner, wife of the Lord Lieutenant of the County of Suffolk, presented the prizes and the proceedings officially ended.

A REMARKABLE FLIGHT.

At 07.23 hours on Apr. 8 Capt. Costes and Lieut. le Brix left Tachikawa, near Tokyo, on their Breguet XIX biplane (500 h.p. Hispano-Suiza engine) and flew to Hanoi, Indo-China, where they arrived at 16.40 hours on Apr. 9. They landed at Sick Toong, near the Tonking frontier, for refuelling.

Capt. Costes and Lieut le Brix arrived in Japan by boat from San Francisco after having flown from Paris to San Francisco by way of the West Coast of Africa, the South Atlantic, South and Central America, and the United States.

They are now attempting to fly from Japan back to Paris.

MOTHS FOR NEW ZEALAND.

It is reported in *The Times* that the New Zealand Government has decided to purchase eight D.H. Moths, four of which will be lent to two newly-formed aeroplane clubs at Christchurch and Auckland, which will have two each. The remaining four will be used as training machines by the New Zealand Air Force at Wigram Aerodrome, Christchurch.

LADY BAILEY'S PROGRESS.

On Apr. 7 Lady Bailey arrived at Mongalla in her D.H. Moth, but a report from Capetown states that Sir Abe Bailey has since received a message from her stating that while landing at Tabora she badly damaged her machine but is unhurt herself.

THE " RED ROSE " IN AUSTRALIA.

On Apr. 7 Mr. W. N. Lancaster and Mrs. Keith Miller flew from Melbourne to Canberra. They were compelled to land en route in order to inquire as to their position.

AEROPLANE PHOTOGRAPHS.

Copies of THE AEROPLANE photographs may be obtained from the Editorial Office of THE AEROPLANE, 175, Piccadilly, W.1, 6 in. by 8 in., at 2s. 6d. each, post free.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Apr. 1.

Flying Time 18 hr. *Instruction* 12 hr. 35 min. *Soloists* 5 hr. 25 min. *Instruction.—With Mr. F. G. M. Sparks*—Mrs. Fraser, Miss Cholmondeley, Miss Fletcher, Miss Wilson, Major A. Mason, Messrs. F. C. Fisher, A. J. Richardson, G. E. Clair. *With Mr. F. R. Matthews*—Miss Cholmondeley, Miss Wilson, Miss Fletcher, Mrs. Guest, Major A. Mason, Messrs. J. A. Murphy, C. R. Jones, R. Ward, J. Brewster, J. Maddock, G. Watson, J. C. V. K. Watson. *Soloists.*—Miss Fletcher, Messrs. E. E. Fresson, J. J. Hofer, H. Solomon, R. Sanders Clark, W. Hay.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending Apr. 8.

Flying Time 36 hr. 35 min. *Instruction* 8 hr. 30 min. *Soloists* 4 h
50 min. *" A " Pilots* 20 hr. 10 min. *Passengers* 1 hr. 45 min. *Tes*
1 hr. 20 min. *Instruction.—With Mr. Parkinson*—Messrs. J.
Middleton, L. M. Middleton, E. J. Griffiths, L. W. Hayton, R.
Dickinson, R. N. Bullock. *Soloists.*—Mr. R. N. Bullock, Dr. R.
Alderson, Messrs. W. L. Runciman, N. Horn. *" A " Pilots.*—Mr
Heslop, Messrs C. Thompson, R. N. Thompson, F. H. Phillip
D. Wilson, H. H. Leech, J. P. de Pledge, N. S. Todd, G.
Brooks, P. F. Heppell, Dr. H. B. L. Dixon, Messrs. J. Lloyd Brown
H. D. Mathews, A. Bell.

Number of Passengers.—Nineteen.

The following members passed the tests for " A " Licences all
splendid style: Dr R. E. Alderson, Mr. W. L. Runciman and M
N. Horn.

Although the weather has been far from ideal a very satisfacto
amount of flying has been made. Apart from a rather choppy win
conditions were fair on Good Friday and Easter Sunday and there w
a good attendance of members.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending Apr. 8.

Flying Time 27 hr. 35 min. *Instruction.—With Mr. Fry*—Messr
W. Mills, E. Varden Smith, A. J. K. Finch, E. Lambert, A.
Lofty, G. Barker. *Soloists.*—Messrs. F. Gough, N. Brett, W.
Ramsay, H. Pank, R. T. Harmer, R. F. Potter, H. Mack, R. W. Moor
W. P. Cubitt, G. F. Surtees, E. Lambert. *Passengers*, 41.

The new Avro Avian arrived this week after a trying journey throu
the snow storms. Everybody is delighted with it and she has not ha
much rest since arrival. Mr. E. Lambert, of Thetford, went off solo
Sunday after four hours' instruction, and three members—Messr
H. Mack, N. Brett and R. Potter—have done their height tests.

On Sunday morning our fleet of three ploughed their way " On
the Hadleigh Rally " just to wish them success in the adventu
They arrived back in time to do a lot of flying during the afternoo

The membership of the Club has now risen to 273.

The Scottish Flying Club.

[Sec.: Harry W. Smith, 101, St. Vincent Street, Glasgow.]

Report for the month of March.

Total Hours Flown 138 hr. 30 min. *Number of Members und*
Instruction 77. *Number of Solo Flights* 91. *Total Number of Act*
Flights undertaken 351. *Number of days when Flying was possible*
Number of members who secured their " A " Licence or joined wi
" A " Licence 5. *Total Number of members with " A " Licence,*

Good progress was made during the month of March as will be se
from the statistics above. In spite of the fact that G-EBVT had
undergo a top overhaul, this did not to any extent curtail the numb
of hours flown.

A steady flow of new members are joining; it will soon be necessa
for the Club to have another machine.

AIR TRAVEL.

COMMERCIAL AIR TRANSPORT Lt.-Col. I. Edwards, C.M.G., and F. Tymms, M.C.	7s. 6d.
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WE, PILOT AND 'PLANE. Charles Lindbergh.	7s. 6d.
AUSTRALIA AND BACK. Sir Alan Cobham.	2s. 6d.
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THE WORLD FLIGHT. Lowell Thomas.	£1 4s.
WITH SEAPLANE AND SLEDGE IN THE ARCTIC. G. Binney.	£1 1s.
THE FIRST FLIGHT ACROSS THE POLAR SEA. Roald Amundsen and Lincoln Ellsworth.	£1 1s.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 6; Monday, 20; Tuesday, 18; Wednesday, 20; Thursday, 30; Friday, 21; Saturday, 19.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 53, passengers 466, freight 15 tons.

Air Union:
Paris—London: Machines 39, passengers 209, freight 11 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 12, passengers 69, freight 3½ tons.

Sabena:
Brussels—London: Machines 12, passengers 19, freight 1 ton.

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 12, passengers 48.

Private:
Machines 6, passengers 2.

Total number of trips by British Machines, 59, carrying 468 passengers. Foreign Machines 75, carrying 345 passengers.

COMPARATIVE FIGURES.

Week ending Apr. 7.:
Machines, 134; Passengers, 813; Crews, 263; Total personnel, 1,076.

Corresponding week, 1927:
Machines, 83; Passengers, 435; Crews, 137; Total personnel, 572.

Corresponding week, 1926:
Machines, 104; Passengers, 513; Crews, 143; Total personnel, 656.

Corresponding week, 1925:
Machines, 98; Passengers, 422; Crews, 132; Total personnel, 554.

Corresponding week, 1924:
Machines, 37; Passengers, 156; Crews, 61; Total personnel, 217.

Corresponding week, 1923:
Machines, 93; Passengers, 366; Crews, 153; Total passengers, 519.

Corresponding week, 1922:
Machines, 96; Passengers, 171; Crews, 140; Total personnel, 320.

Corresponding week, 1921:
Machines, 55; Passengers, 183; Crews, 70; Total personnel, 253

Corresponding week, 1920:
Machines, 44; Passengers, 46; Crews, 46; Total personnel, 92.

Croydon Notes.

Easter week invariably brings a heavy traffic to Croydon, and this year it has beaten previous records easily. One of the novel features of this year has been the departure from the aerodrome of private owners on their own machines going southwards for the holidays. On Thursday Flt. Lt. the Hon. J. H. B. Rodney on G-EBVZ (D.H. Moth), belonging to Sq. Ldr. the Rt. Hon. F. E. Guest, Mr. Vaizey on G-EBVD (Avro Avian), and Mr. Downes-Shaw on G-EBST (D.H. Moth) left for France. On Friday Mr. Kittel followed them on his Moth G-EBTH. A number of other private owners seem to have evaded Croydon by clearing Customs at Lympne.

Thursday was by far the heaviest day of the week, and the Paris services were very heavily loaded indeed. Imperial Airways took 88 passengers to Paris in seven machines and brought back 33 in three machines. Air Union took another 26 passengers to Paris and brought back 9. Many more could have been carried had there been machines available.

With the coming of April the licence granted to the buffet in the main booking hall at the new buildings came into force, and from now onwards thirsty passengers and friends may now satisfy their desires for liquid refreshment—within the appointed hours—without difficulty. The fact that the licensing authorities have restricted the licence to passengers and friends naturally makes for a universal friendliness towards passengers which will doubtless help to popularise flying.

The nuisance of cars parking themselves outside the aerodrome on the Croydon by-pass road has been very acute during the week-end. It is, of course, idle to expect the police to attend to a matter of this kind, but the Air Ministry certainly might do something to mitigate it. There is a public enclosure, but nothing to tell the public so, and certainly nothing to attract them into it.

COMPARATIVE PERFORMANCES.

In The Aeroplane of Mar. 28 under the heading "Croydon Notes," the statement was made that "the new Junkers G.31 which recently arrived at Croydon has a top speed of 125 m.p.h. and cruises at well over the 100 m.p.h., which is considerably more than the speed of any British civil machine of equal capacity."

A correspondent points out, very rightly, that the De Havilland Hercules (three Bristol Jupiter engines) compare very favourably with the G.31 for speed, load and performance generally, and that though the speed of the Armstrong Whitworth Argosy (three Armstrong-Siddeley Jaguar engines is rather less, the load carried is bigger.

One apologises to the readers of The Aeroplane and to th manufacturers of the Hercules and the Argosy and their engines for this obvious lapse by the writer of the paragrap

C. G. C

MR. VAN LEAR BLACK'S TRAVELS.

Between Jan. 16 and Mar. 13 of this year, Mr. Van Lea Black travelled 12,150 km. (7,550 miles) in the Fokker F.VI (Jupiter engine) which he has chartered from the K.L.M. piloted by Mr. Geyssendorffer. In detail his journeys in thi period were:—

Jan 16, London—Liverpool and back. Jan. 17, London—Paris. Jan. 18, Paris—London. Jan. 25, London—Amsterdam. Jan. 28, Amsterdam—London.

Feb. 4, London—Berlin. Feb. 7, Berlin—London. Feb. 1 London—San Raphael. Feb. 15, San Raphael—Paris. Fe 16, Paris—London. Feb. 24, Rotterdam—Copenhagen, an Copenhagen—London.

Mar. 2, London—Leipzig. Mar. 4, Liepzig—London. Ma 7, Flight over London. Mar. 8, London—Paris. Mar. 1 Paris—London. Mar. 13, London—Bordeaux.

AIR MAILS.

The Postmaster-General announces that beginning o Monday, Apr. 2, the despatch daily (except Sundays) c letter mails will be resumed on the London-Lyon-Marseill route (Routes 1 and 2, Air Mail Leaflet), but not to Genev at present. The latest time of posting at the General Pos Office, London, will be 5 a.m. The special fee has bee reduced to 2d. per ounce, as for the rest of France.

This route will normally give advantage for letters fo the South of France, and on Fridays an opportunity of over taking at Marseille (or Toulon) the mails despatched fro London by ordinary service the previous evening for Egypt India, 'Iraq, Australia, East Africa, etc.

PERSONAL NOTICES.

Deaths.

HADDEN.—On Apr. 2, near Colchester, as the result of a flyin accident, Jack Hadden, Lieut., Black Watch, and Flg. Off., No. (Army Co-operation) Squadron, R.A.F.

Mr. Hadden was seconded to the R.A.F. from the Black Watch i July 1925, and after a course of flying instruction at No. 2 Flyin Training School, Digby, was posted to No. 2 (Army Co-operatio Squadron.

HALE.—On Apr. 3, at Hong-Kong, as the result of a flying acciden Alfred William Beverley Hale, Flg. Off., No. 440 (Fleet Spotte Reconnaissance) Flight, R.A.F.

Mr. Hale passed out of the R.A.F. Cadet College, Cranwell, i December, 1925, and was posted to No. 25 (Fighter) Squadro Hawkinge. He was appointed to the R.A.F. Unit in H.M.S. *Herm* in December, 1927. He played Rugby football for the Cadet Colleg at Cranwell.

TOWERS.—On Apr. 2, near Colchester, as the result of a flyin accident, AC.1. George Henry Towers, No. 2 (Army Co-operatio Squadron, R.A.F.

WAUGH.—On Apr. 2, near Hillah, 'Iraq, as the result of a flyin accident, AC.1. William Waugh, No. 30 (Bombing) Squadron, R.A.

WOOD.—On Apr. 2, near Hillah, 'Iraq, as the result of a flyin accident, Jack Whitworth Wood, Plt. Off., No. 30 (Bombing) Squadro R.A.F.

Mr. Wood entered the R.A.F. with a S.S. comn in January, 192 and was posted to No. 30 Squadron after a course of flying instructio at No. 4 Flying Training School, Abu Sueir, Egypt.

Marriage.

WELLS—YOUNG.—On Mar. 26, at Nice, Sq. Ldr. John Kilner Well A.F.C., R.A.F., to Elizabeth Dalway, youngest daughter of the la Robert Evans Young, of Ottawa.

Forthcoming Marriage.

BRIGGS—MANSFIELD.—The engagement is announced, and t marriage will take place in Bombay, India, on May 18, between F Lt. Cyril Ferdinand Briggs, R.A.F.O., youngest son of the late M Henry Briggs and Mrs. Briggs, of Leighton Buzzard, and Bernice Zo only child of the late Mr. Ernest Mansfield and Mrs. Mansfield, 3, Hyde Park Mansions, W.

Birth.

FITZGERALD MOORE.—On Apr. 2, at 1, Cleveland Gardens, Londo to Dorothy, wife of Sq. Ldr. B. Fitzgerald Moore, R.A.F.—a son.

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THE AEROPLANE—APRIL 18, 1928.

TRANSATLANTIC.

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 16. SIXPENCE WEEKLY.

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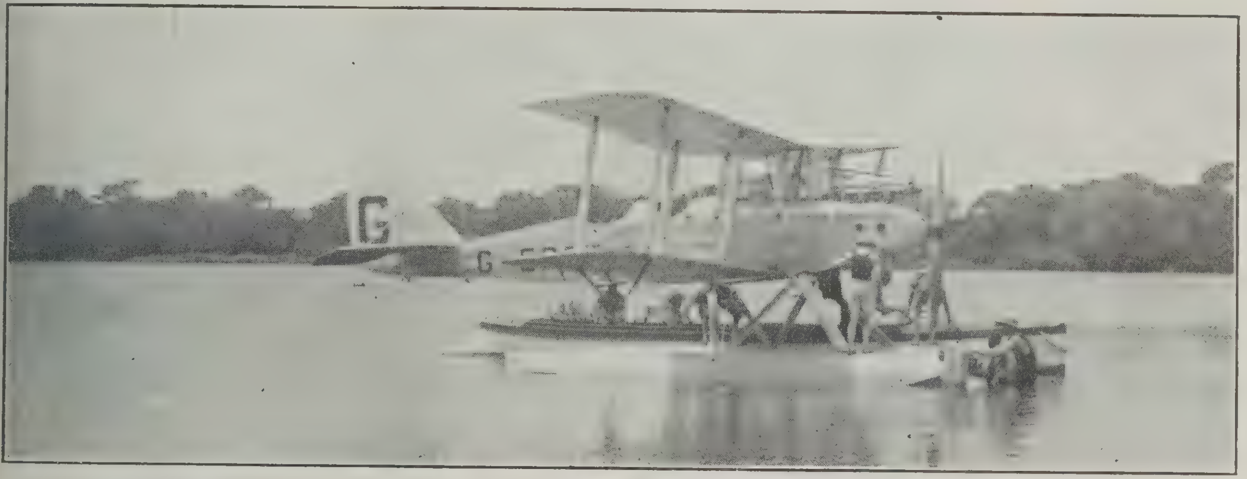

THE ZAMBESI SURVEY:—A D.H.9 (Nimbus engine) of the Aircraft Operating Co. Ltd. on the Zambesi River, where the Aircraft Operating Co. Ltd. is engaged in an aerial survey. This machine was converted into a seaplane at Livingstone.

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LADY HEATH has just completed a flight from Cape to Cairo in her Avro Cirrus-Avian. Still leading the way, the Avian is the first light aeroplane to accomplish this. Incidentally it is the first solo flight from Cape to Cairo, and Lady Heath is the first woman to fly this course.

Following Mr. Bert Hinkler's wonderful flight from England to Australia in his Avian, and Capt. Lancaster's brilliant achievement also from England to Australia, in an Avian, this latest triumph leaves no room for doubt as to the Avian's superiority in every sphere of flying.

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APR. 18, 1928.

THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV. No. 16.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON THE TRANS-ATLANTIC FLIGHT.

To our German fellow-workers in the cause of Aviation all Englishmen will offer their heartiest congratulations on having produced the aeroplane, the engine, the financier and the pilot which and who have made the first heavier-than-air flight across the North Atlantic from East to West. No nation better deserves such a distinction.

German Aviation has for ten years laboured under the heaviest burdens. Held down for seven years under the infamous Clauses of the Treaty of Versailles, Germany was prevented by French jealousy from building either aeroplanes or engines of such size as to be of any real use. But German scientists and German engineers worked with true Teutonic industry at the basic problems of aviation, ready to use their discoveries when the time came.

Of these workers none has been more determined than Herr Junkers and his engineering staff. Despite the wanton destruction of much of their most valuable war-time work by the Inter-Allied Commission of Control during the years immediately following the Armistice, the Junkers Works were among the first in the World to produce big passenger-carrying aeroplanes which were properly suited o their job, instead of being modifications of war-time machines with inadequate and cramped seating. Also the unkers Works produced the first all-metal passenger air-raft which flew properly.

JUNKERS ACHIEVEMENTS.

With these all-metal Junkers monoplanes, single-engined nd twin-engined, many remarkable flights have been made. wo Junkers single-engined monoplanes flew from Berlin o Pekin and back. Others have travelled all over Russia nd down to Persia. Junkers machines now work regular ir-lines in Persia. And for years Junkers seaplanes have een used over the rivers of the United States of Colombia n a line which was for long the only air-line to show a ommercial profit.

In Germany, after the Inter-Allied prohibitions were removed, Junkers monoplanes captured all the official World's records for weight-lifting machines. And quite recently a unkers beat the World's Record for Duration, held by Mr. Chamberlin and Mr. Acosta.

The Junkers firm has never troubled about speed. It as concentrated on reliability.

Having solved the many problems of making an aero-lane built entirely of duralumin stay put in one piece,—in spite of its thousands of rivets and the strange vibrations of sheet metal,—Herr Junkers and his men turned to pro-ucing a motor of equal reliability. They took as a base the .M.W. (Bayern Motoren Werke) which was one of the last nd best German engines of the War 1914-18. And they have now got the engine which beat the atmosphere of the Atlantic.

The net result is the first spectacular flight achieved by Germany since Rudolph Böhm beat the Duration Record in 1914, just before the outbreak of War, and became the first aviator to fly for more than 24 hours without landing. And the distinction is worth having, despite the fact that the flight was done on a single-engined land machine which was perfectly unsuited to such a journey.

Though we who are on the inside of Aviation know the merits of the Junkers aircraft because of their consistent regularity on German air-lines, the Great Ignorant Public of the World are more impressed by a successful gamble than by success won on sheer commercial merit.

We, with our flying-boats which are so far ahead of any others in the World, might have done the journey ourselves under conditions which would at any rate have been one step or two in the direction of progress. But, like all the other records which we might have had and have not, we have missed it through sheer lack of enterprise.

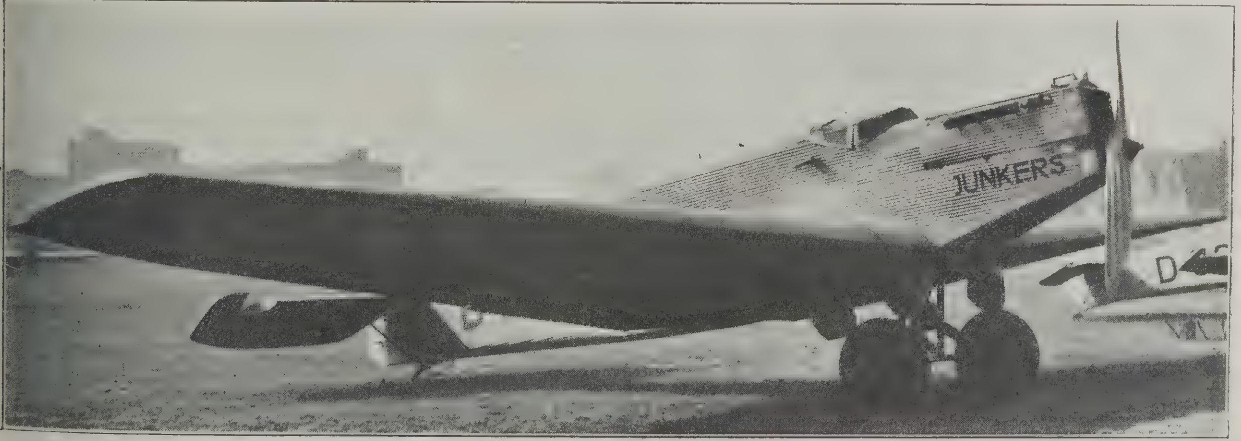
THE GREAT GAMBLE.

As for the flight itself, it was, like all trans-oceanic flights on unsuitable machines, simply flying in the face of Providence. That ever-to-be-lamented humorist, Gordon Bell, in the pre-War days when he used to fly hazardous machines of incalculable characteristics used to remark "I'm g-g-going up to have a g-g-gamble with G-G-Gabriel." And this flight was just that.

The unfortunate thing about it is that it was made from an outlying island of Europe to an outlying island of America. So it no more puts a stop to silly trans-Atlantic attempts from East to West than the discovery of the Caribbean Islands by Christopher Columbus put a stop to the discovery of America.

If only it had been made from Berlin to New York it might have ended such nonsense, and the World's aeronautical people might have settled down to designing and producing a flying-boat-cum-life-boat which would be a step or two in the direction of the kind of aircraft which will in the end assure a quick and safe trans-Atlantic air service. As things are we shall merely have a lot more seekers after bubble reputations either drowning themselves in the Atlantic or being saved therefrom. And in either case a vast amount of valuable time will be wasted in deflecting from their courses a number of liners and cargo-boats to look for these self-advertisers.

Until something new in the way of trans-oceanic air-



THE "BREMEN."—The Junkers monoplane on which Herr Köhl, Baron von Hünefeld and Commandant Fitzmaurice made the first east to west flight across the Atlantic.

craft is produced, the game is not worth the candle. And one cordially agrees with Sir Sefton Brancker in wishing that somebody would get across the whole way, and put an end to this nonsense.

Legal Hindrances.

There is no actual justification for stopping such flights by legal action. In fact there is no law by which they can be stopped, other than that which arrests attempted suicides.

Of late certain adventurous aviatresses have been stopped by the local Authorities from flying over hostile or savage country, unless escorted by a mere male person. But that is another matter. If these adventuresses (using the word in a purely complimentary sense) had been forced to land, and had been captured and eaten, or otherwise maltreated by the natives, the British Taxpayer would have been forced to pay for an expensive punitive (or punative : *vide* Hansard) expedition, to teach the tribes to curb their natural appetites, and to respect the persons of British subjects. So the Authorities were justified in putting hindrances in the way of these venturesome ladies.

But even the British Navy cannot curb the appetite of the Atlantic. And therefore those who seek the limelight of ocean-flying may well be left to their own devices. And, if the great steamship lines let them know clearly that not a single vessel will be deflected a mile from her course in answer to calls of S.O.S. or "*M'aidez*" from aircraft, perhaps they will acquire a little more sense.

A Useful Precedent.

In the early days of the motor-car services across the Arabian Desert from Baghdad to Damascus,—before French mis-rule made Syria a war-area,—the Nairn mail-cars were continually being stopped to pick up passengers from broken-down cars run by native traders. These natives used to buy up ancient Fords and things, and run a cheap car service for pilgrims. Sometimes parties of pilgrims used to buy old cars in Baghdad and venture on the Desert Route themselves.

In all such cases, whether the cars got across or not was a pure gamble, for they were always over-loaded and could only carry barely enough food and water for a journey without accident. Any breakdown meant either being picked up by the Nairn cars or dying in a few days from lack of water. The Nairn cars themselves were always fully loaded, so the addition of these stranded natives meant imperilling the safety of the mails and passengers.

Ultimately the Nairn people had to issue notices in Baghdad and Damascus that under no circumstances would their cars stop to rescue people from other cars. And those notices ultimately did stop most of the cheap-and-nasty desert services. But those who have travelled on the route have told one that for a while running past broken-down cars with natives standing by them with their tongues hanging out and waving supplicating arms was quite a nasty business.

The ordinary sentimental sailor-man might not like to ignore an S.O.S. signal from a sinking aircraft a hundred miles or so away. But orders would be orders. And if these aeronautical seekers after notoriety knew that they would be left to sink they might be led to think.

The Successful Flight.

As to this successful flight. It was apparently financed by Baron von Hünefeld, a German sportsman who, we have been told, wears an eyeglass. That, one judges, is his chief claim to distinction. Anyhow, he deserves respect, for, unlike most financiers of dangerous ventures, he shared the risk with his employés.

Of Herr Köhl we only know that he is a German pilot of proved ability. And his success proves his skill as a pilot. To have taken such a pure gamble is singularly un-German. But we may assume that whatever German industriousness could do to reduce the risks of such a flight in a single-engined machine was done.

The Junkers monoplane, known as the *Bremen*, was flown from Germany on March 26 to the aerodrome at Baldonnel, near Dublin, in the Irish Free State.

The Irish Factor.

There, after a German mechanic, who was also a reserve pilot, had gone home a week or so since, Commandant Fitzmaurice, who is the commander of the Irish Free State Air Force—an arm of the Army—joined himself to the crew. He was a pilot in the R.A.F. during the War 1914-18. Last year he accompanied Mr. MacIntosh in the *Princess Xenia* in an attempt to fly the Atlantic,—an attempt which ended on the coast of Kerry.

In an article on Commandant Fitzmaurice that brilliant writer Mr. H. V. Morton of *The Daily Express* says that he asked him (Commandant Fitzmaurice) what he expected to get out of such a flight, the reply was,

> In the first place I'd like the youngest Air Force in the World to be represented in the first east to west flight. It would put our little Air Force on the map.
>
> In the second place I might lift myself out of the rut, I want to get enough money to establish civil aviation in Ireland. Everybody is ready for it but the money.

Well! He has got there. But one imagines that, if he had not, his death would pretty well have put "the youngest Air Force" off the map—seeing that he seems to be its mainspring, or at any rate its live wire. Still, one does not quite see how a flight with a German pilot in a German machine with a German engine affects the cartographic position of the Irish Free State's air force.

As to Ireland being all ready for civil aviation bar the money,—that is always the way with Ireland.

Ireland had the first electric railway (Portrush) in the World, and the first electrically-lighted town (Carlow) in the World, and has had quite a lot of first other things in the World,—always at somebody else's expense. But always, just when Ireland begins to make big money out of business—as before 1798 and about 1850-60, and during the War 1914-18—some fool Irishry go and raise a rebellion and drag the country back into its native poverty and anarchy, from which only a Strafford or a Cromwell can evolve order and good Government.—So what sort of hope is there for Civil Aviation in Ireland, except to help people to leave it in a hurry?

The Voyage.

Anyhow, the *Bremen* left Baldonnel on Thursday, April 12, at 5.30 a.m., and after a delay which naturally caused considerable anxiety to those immediately related to the crew, a wireless message was received in England late on Friday April 13 that she had landed in a snowstorm on Greenly Island, in the Straits of Belle Isle.

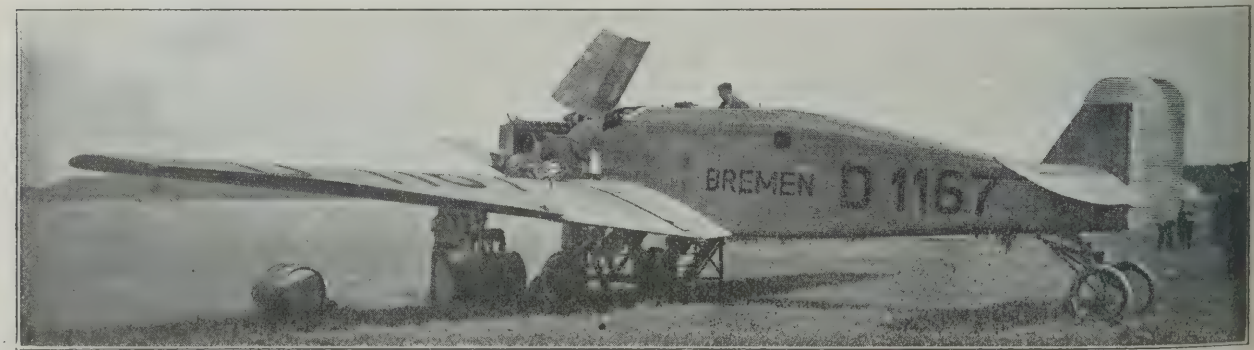
As this is about the nearest land to Europe, and as the *Bremen's* petrol was just about used up, the crew were lucky in reaching land where they did.

So ends the flight. And that is about all there is to say of it. The crew are to be congratulated on having survived. And one hopes that this experience will teach them to expend their undoubted courage and energy on something more useful in future.

No good purpose has been served by the flight. No technical information has been gathered about machine or engine which could not have been gained by flying over land.

No meteorological information has been gained. Such knowledge can best be got by regular study in aircraft flown from a seaplane-carrier.

But the North Atlantic has been crossed from East to West by aeroplane. One hopes that that will learn it to be the Atlantic. For heart-interest in the flight see the daily Press.—C. G. G.



PREPARING.—Another view of the "Bremen" taken in Germany before leaving for Ireland and America.

Speed!

"Certainly the Napier engine must rank as one of the outstanding achievements of man's creative genius.

It has just enabled Capt. Campbell to raise the land record to 207 miles an hour, and installed in Flight Lieut. Webster's aeroplane (Supermarine) it gave an average of 283·6 miles an hour in the Schneider Trophy race over a distance of 100 kms."

Morning Post,
21st Feb. 1928.

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THE FIRST WESTERLY CROSSING OF THE ATLANTIC.

Capt. Köhl, lately in the service of the Deutsche Luft Hansa, Baron von Hünefeld, accompanied by Commandant (now Major) J. C. Fitzmaurice, of the Irish Free State Air Force, left Baldonnel Aerodrome, near Dublin, on the Junkers monoplane "Bremen" at 05.30 hours on Thursday, April 12, on an attempt to fly to New York.

On Friday evening at about 18.30 hours Greenwich time their machine landed on Greenly Island, in the Straits of Belle Isle, Labrador, having failed in their objective, but after making the first successful direct crossing of the Atlantic from East to West.

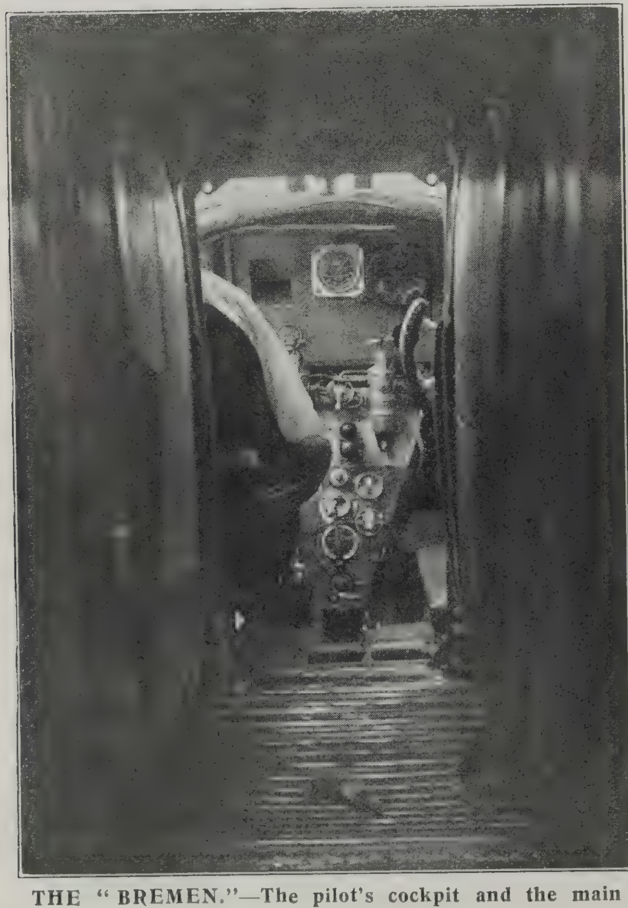
Greenly Island is a remote and inaccessible spot, at the moment ice-bound, and the nearest point in communication with the outside world is Amour Point, fifteen miles away on the Labrador mainland, where there is a lighthouse with a wireless station. Therefore information as to the events of this flight are at present scanty.

Such reports as have been received indicate that the Bremen, after meeting strong adverse winds, ran into thick fog off the American coast, and landed on the ice, short of petrol, near the first land they had seen. In landing the machine was damaged, to what extent it is not reported, but there is apparently some possibility that repairs can be made on the spot and the flight continued.

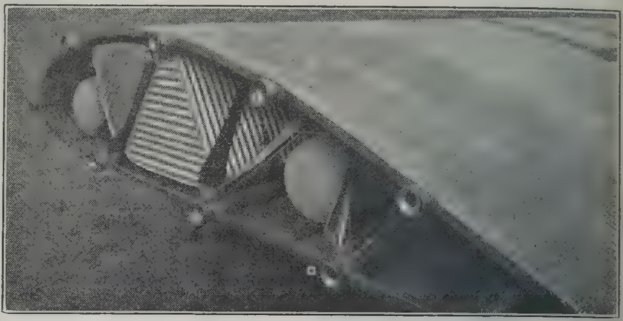
Fortunately Greenly Island has a permanent population of about fourteen persons, and there is no danger that the crew will suffer any serious hardship or exposure, but owing to their inaccessibility of their position considerable delay may occur in getting materials for repair and supplies of petrol to the spot.

The fact that a total of 37 hours was required to cover a total distance of about 2,100 miles—an average speed of about 56 m.p.h.—when compared with the general average of about 110 m.p.h. achieved on the west-east Atlantic trips, gives some index of the appalling difficulties of this particular trip. And the fact that the Bremen landed over 300 miles north of the intended course is further evidence of how much more serious an undertaking this particular journey is under present conditions.

This very remarkable flight was made on a standard Junkers L.33 monoplane fitted with one Junkers L.5 engine of 310 h.p. This type of machine is desgined for freight and mail-carrying purposes, and has a very large compartment behind the pilot's seat for goods. The only modification made to the Bremen for this flight was the fitting to this freight compartment of two enormous petrol tanks of approximately 1,100 litres (500 galls.) each.



THE "BREMEN."—The pilot's cockpit and the main petrol tanks.



THE "BREMEN."—A section of one wing showing wing tanks and flotation bags.

The Bremen empty weighed 1,360 kg. (3,000 lbs.), and as loaded for the start of this flight, 3,700 kg. (8,140 lbs.), thus carrying a total load of nearly 2¾ times her own weight. Of this 1,900 kg. (4,180 lbs.) was fuel and 200 kg. (440 lbs.) oil.

The Bremen's flight is a performance which reflects every credit on her crew and on her construction. It has demonstrated that the east-west crossing of the Atlantic is possible, also that it is an exceedingly hazardous journey. It is to be hoped now that this crossing has been accomplished once that no further attempts on it will be made until aircraft more suited for this work are available.

The Irish Free State Army authorities have promoted Commandant Fitzmaurice to the rank of major.

CONGRATULATIONS

Sir Samuel Hoare, Secretary of State for Air, has sent the following telegram to Mr. Cosgrave :—

> The Air Council send warm congratulations on participation of an officer of the Free State Air Force in the first successful flight across the Atlantic from East to West.

Sir Samuel Hoare also telegraphed to the German Ambassador in London :—

> The Air Council desire to offer warm congratulations on the successful achievement by German aviators of first flight across Atlantic from East to West.

Mr. Cosgrave, President of the Council in the Irish Free State, on Saturday telegraphed to Major Fitzmaurice :—

> To the crew of the *Bremen* and particularly to yourself as an officer of the Irish Air Force, I tender my heartiest congratulations on sharing first flight from Europe to America. Ireland is proud of your gallant part in this great advance towards the conquest of the air. Please convey to Baron von Hünefeld and Capt. Köhl my admiration and congratulations.

Also on Friday Mr. McNeill, Governor-General of the Irish Free State, received the following cable from Mr. Coolidge, President of the United States of America :—

> I wish to express to you as well as to the people of the Irish Free State the great admiration of myself and the people of U.S.A. for Commandant Fitzmaurice's share in the magnificent flight of the *Bremen* and to rejoice for a safe arrival.

The Governor-General's reply to Washington was as follows :—

> I appreciate your kind message of congratulation to the Irish people on splendid achievement of Commandant Fitzmaurice and his German comrades. May their heroism prove of lasting service to humanity and by completing the aerial conquest of the Atlantic lead to even closer relations between our countries.

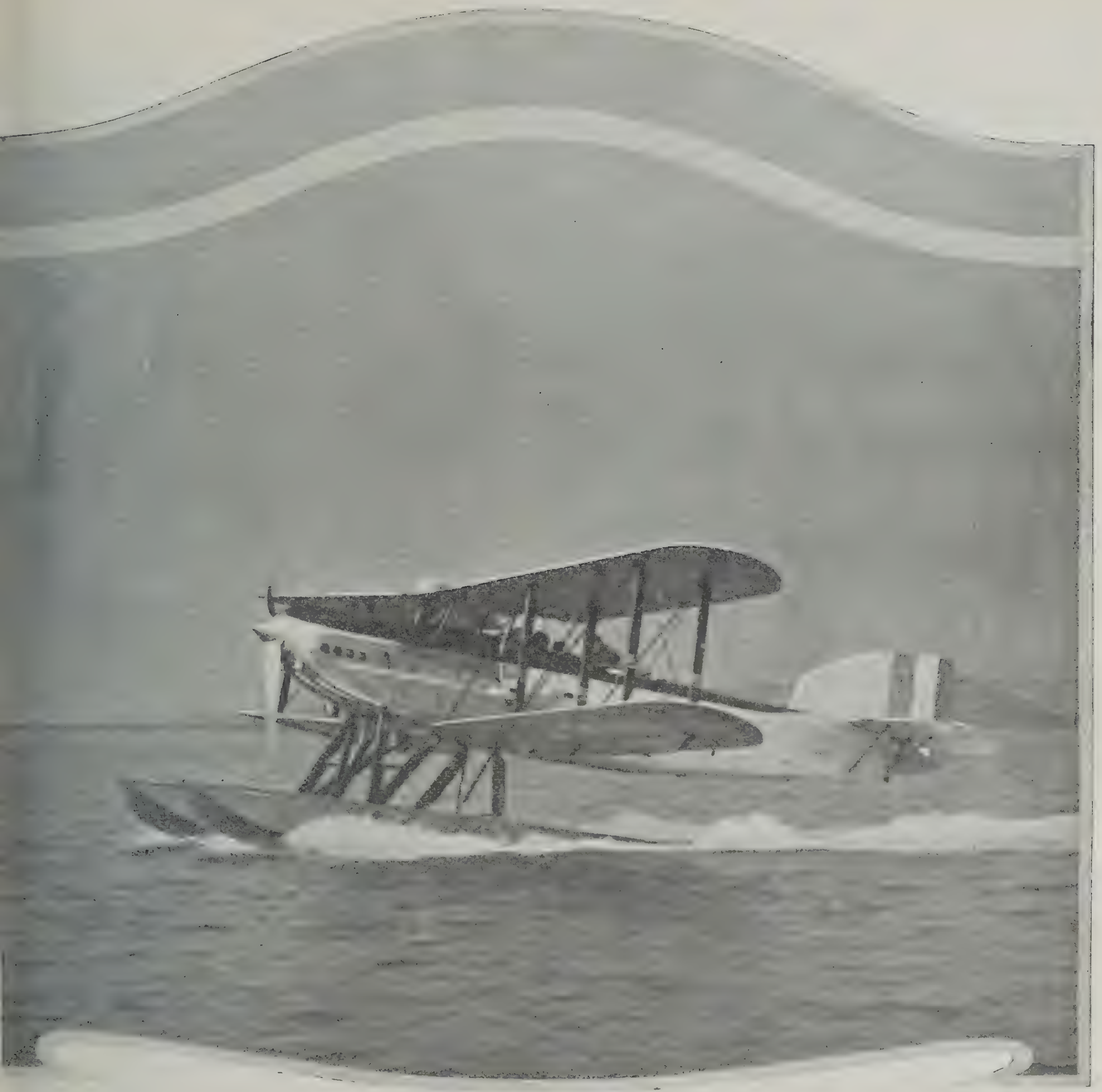
Mr. Desmond Fitz-Gerald, Minister of Defence of the Irish Free State, has cabled to Major Fitzmaurice :—

> Heartiest congratulations on magnificent achievement. The Army is proud of the Irish Air Force's association with the first flight from Europe to America. Please convey to Baron von Hünefeld and Captain Köhl my admiration and warmest congratulations.

As THE AEROPLANE goes to press it is reported that an aeroplane belonging to Canadian Trans-continental Airways reached Greenly Island from Murray Bay, Quebec, on the afternoon of April 15, and left the next morning for Quebec with Major Fitzmaurice as a passenger. Capt. Köhl and Baron von Hünefeld remain at Greenly Island, and arrangements have been made for the despatch to them by air of spares for their undercarriage and of a supply of fuel.

According to the latest reports the Bremen met good weather except for a noticeable head wind for the first thirty hours of their journey, but then ran into thick fog. At a time when they should have been over Newfoundland the fog lifted temporarily, then became thicker still, and finally changed to sleet and snow and the wind freshened to a gale.

At this time their compass began to behave in an erratic fashion, the machine was being laden with ice, and their fuel supply was on the point of exhaustion, when they saw the lighthouse on Greenly Island. They immediately landed on the ice, damaging their tail-skid and airscrew in the process.



The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier "Lion" engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

ON THE GREATEST WORLD-FLIGHT.

By their arrival at Le Bourget, Paris, on Sunday last, Capt. Costes and Lieut. le Brix have ended safely what has certainly been the World's greatest flight up to the present day. Except for the crossing of the Pacific they have flown right round the World,—and more than that, for they have flown from one end of America to the other.

Their distance is said to be 35,000 miles in 330 flying hours. One has not checked it accurately. But in a flight of this kind mere mileage is of less account than the variety of countries over which the flying has been done. And it is because of that variety that one calls this the World's Greatest Flight.

Capt. Costes (right) and Lieut. de Vaisseau le Brix.

Capt. Costes and Lieut. le Brix, the former a war-time Army pilot and the latter a present-day Naval officer, have shown themselves to be worthy of the highest traditions of French gallantry and sustained courage. And one offers to our former Allies of France, the most sincere congratulations of all British aeronautical people.

The flight combined the fool-hardy daring of a forlorn-hope dash on a land machine across the South Atlantic with the steady determination of regular flying of long distances day by day. And with this curious combination of characteristics the French aviators showed the diplomacy of ambassadors in their dealings with the many different peoples in whose capitals they landed.

In calling this the World's Greatest Flight one does not forget the U.S. Army's flight completely round the World. That, however, was round the Northern Hemisphere only, and many machines and engines were used, whereas Costes and le Brix crossed the Equator twice, and only used one aircraft.

Nor does one forget the great flights of the Marchese de Pinedo. But he took more time, and used more than one machine, and several engines.

Other great flights there have been, but none have combined to quite the same extent, reckless daring, cool courage, great skill, and steady endurance.

Naturally, outside France, this great performance is overshadowed in the public eye by the first East-to-West Atlantic flight. Just why crossing the North Atlantic should excite more interest than crossing the South Atlantic is difficult to understand. The Northern ocean is colder, but the distances are about the same, and if one is not in a hurry, one can find as good weather in the North as in the South.

Probably the underlying reason is that there are more newspapers per mile of coastline between Labrador and New York, and between Orkney and Bordeaux, than there are between Casablanca and Dakar, and between Trinidad and Rio. So the Northern crossing has more noise made about it.

Actually the flight from Ireland to Greenly Island was equal to about two-thirds of some of the stages covered by Costes and le Brix. And the stages by which the journey from Tokyo to Paris were covered, proved that Costes, who was the pilot all the way,—must be a man of extraordinary endurance. Also the accuracy with which the pair reached their intended ports every time shows that le Brix is a navigator of the first order.

The statement has been made that the same Hispano-Suiza engine was used from start to finish. If this be true the achievement is very fine,—though it is well to remember that Napier Lions in the R.A.F. have often run 400 hours without overhaul. The survival of the Breguet aeroplane is more a matter of good piloting than anything else, for in these days any aeroplane is expected to stan up to 100,000 miles of flying without re-conditioning and without anything serious going wrong. But the Breguet firm d deserve congratulations on their undercarrige having stoo up to so many landings on strange aerodromes.

Altogether it was a magnificent performance, and if eve aviators deserved the title of Champions they are the gallan Costes and le Brix.—C. G. G.

The Progress of the Flight.

Capt. Costes and Lieut. le Brix, who, as recorded in th last issue of The Aeroplane, left Tachikawa, near Tokyo, o Apr. 8, landed at Le Bourget, Paris, at 18.15 hours on Apr. 14 having completed this stage of their journey in seven flyin days.

They were seen to pass over Shanghai, 1,100 miles fro Tokyo, on the evening of Apr. 8, and they reached Hanoi Tongking, at some time on Apr. 9. On Apr. 10 they lande at Dum-Dum aerodrome, Calcutta, at 18.00 hours, and afte refuelling and dining left there at 23.00 hours for Karach which they reached at 07.20 hours on the morning of Apr. 11

Leaving Karachi at 18.00 hours on Apr. 11 they reache Basrah in the morning on Apr. 12 and left once more a 13.00 hours for Aleppo which they reached at 05.00 hours Leaving Aleppo on the same day they next landed at Tat Aerodrome, Athens, at 18.00 hours that evening.

From Athens they flew to Marseilles, where a wing ti was damaged in landing on the morning of Apr. 14, bu despite this the journey to Paris was completed, after stripping the fabric from the tip of the other wing to balanc the machine.

Capt. Costes and Lieut. le Brix left Paris on Oct. 10, 192 crossed the South Atlantic non-stop from St. Louis, Senega to Natal, Brazil, on Oct. 14-15, thus accomplishing the fir mainland to mainland crossing of this ocean, and thereaft flew many thousands of miles in South America.

On Jan. 30 of this year they left South f North America by flying from Guatemala City to Mexic City. Thereafter they toured the United States, visiting mo of the important cities, ending at San Francisco. From Sa Francisco they shipped their machine to Tokyo, fro whence, as already recorded, they flew home.

On this trip these two pilots have flown over 35,000 mile in 338 hours of flying time on one Breguet XIX aeroplan using two Hispano-Suiza engines of 500 h.p. in the journe Before starting on this journey the same Breguet XIX ha flown over 40,000 miles in various other long-distance flight

Except for the crossing of the Pacific Capt. Costes an Lieut. le Brix have flown completely round the world, an their final journey home from Japan, made in under seve days, and largely flown at night, must be regarded as amon the finest performances of the kind yet made.

The return of the two pilots to Le Bourget was marke by intense enthusiasm shown by large crowds not only the aerodrome, but along the whole of the route to Pari In spite of the efforts of the police some 500 spectators brok onto the aerodrome and received Capt. Costes and Lieut. Brix with such fervour that the latter fainted under the ministrations.

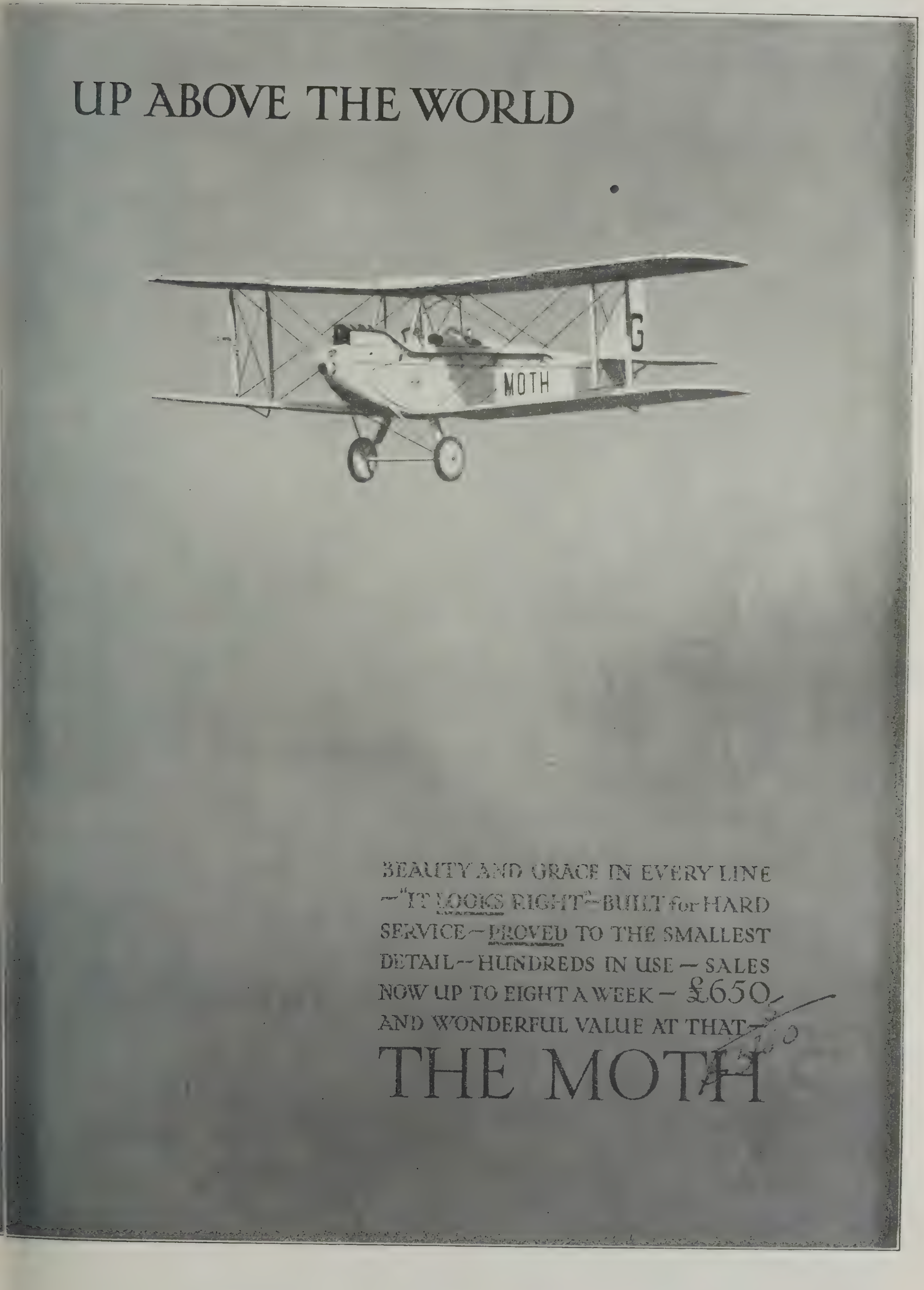
After delivery from their admirers the pilots were receiv by M. Poincaré at the Ministry of Finance, and were th permitted to dine in peace. After dinner however both visite the Velodrome d'Hiver where a six-days' bicycle race is i progress, and here they were persuaded to mount on bicycl and ride round the track to the great enthusiasm of a beholders.

On Apr. 15 Capt. Costes and Lieut. le Brix were received Rambouillet by the President of the French Republic, M Doumergue, who decorated them with the insignia of Office of the Legion of Honour.

AN AFGHAN-SOVIET AIR AGREEMENT.

The Times correspondent at Lahore, in a message dat April 12, states :—

> The Afghan newspapers state that a technical agreement has be concluded between the Afghan and Russian Air Departments in rega to the Kabul-Tashkent air service.
>
> The agreement provides for the maintenance of representatives the air department of each country at its respective Consulate or Le tion. Thus the Russian Air Department will be represented at t Russian Legation at Kabul and the Afghan Air Department at t Afghan Consulate at Tashkent, while the representatives must nationals of the country to which they respectively belong; naturalis Afghans are ineligible for this purpose.
>
> The Afghan Air Department will provide landing grounds Haibak, between Haibak and Khanjan, at Khanjan, and betwe Khanjan and Charikar before Aug. 1 next.



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MORE ABOUT AIR-COOLED RADIALS.

[Following Mr. Roy Fedden's interesting discourse on Air-Cooled Radial Engines last week further enlightenment will be found in the letter which follows hereafter. The writer, Mr. F. B. Rentschler, is the President of The Pratt and Whitney Aircraft Co., of Hartford, Connecticut, U.S.A. This firm is a new branch of the Pratt and Whitney Co. which is famous all over the World for its machine-tools. Mr. Rentschler and Mr. Mead left the Wright Co. shortly after that firm had produced the record-breaking Whirlwind engine, and within a few months had produced the Pratt and Whitney Wasp,—which is recognised as one of the best high-powered radials. Under such circumstances Mr. Rentschler's views are well worth having, and THE AEROPLANE *is complimented by being allowed to publish them.]*

I have read with a great deal of interest your article on power plant problems which appears in the Feb. 29 issue of THE AEROPLANE. I believe you have covered the entire field impartially and given everyone a great deal to consider.

During the past five or six years almost all design effort on the part of "air-cooled" engineers has been along the lines of overcoming a number of very definite mechanical difficulties which were present when air-cooled engines were required to operate on the same basis of efficiency as the well-developed and older water-cooled types. Most of this air-cooled development experience has, of course, been with the fixed radial type.

Several years ago it was easy enough to design successful air-cooled radial engines, providing they were operated at low r.p.m. and comparatively low Mean Effective Pressure. Particularly in the high-speed single- and two-place ships the air-cooled radial was at a hopeless disadvantage until the type could be developed to operate successfully on a basis equally as efficient as the water-cooled type.

It is never possible to obtain exact comparisons in the air with different types of equipment, although sometimes the comparisons can be made on reasonably comparable conditions. The Curtiss water-cooled D-12 and the Pratt and Whitney air-cooled radial Wasp are practically of the same power. Aside from the weight-saving due to water, radiators, etc., the Wasp weighs some forty or fifty pounds less than the "dry" weight of the D-12.

According to official records there is less than a mile an hour difference between the top speeds of a standard Service Hawk when fitted with the Wasp or the D-12. It would seem, therefore, that an efficient radial engine does not suffer in high-speed performance.

It is conceded that if wing radiators are fitted to the water-cooled ship, then there is a gain in high speed, but it is generally believed that wing radiators are undesirable both from the standpoint of Service difficulties and vulnerability.

I do not quite understand your statement that the radial engine is limited in diving speed. I presume you mean that it is impossible for the radial to safely negotiate the high crank-speeds resulting from a steep dive. Wasp engines now in service are rated at 1,900 r.p.m. for level flight, but we expect them, and they are regularly asked, to withstand safely crank speed operation up to 2,500 or 2,600 r.p.m. The new Wasp series just now going into production are rated at 2,100 in level flight, and it is expected that this type will withstand the comparatively greater crank-speeds. It has been demonstrated that the Wasp can be dived fro any altitude attained, and in a dive with full throttle equally as fast as the water-cooled ship.

[What one meant was that an aeroplane with a star-fis engine on its nose must have a limiting diving speed (du to head-resistance) considerably less than that of a machin with an engine which can be cowled in to give the nose th lines of a dog-fish. One was not thinking of air-screw revolutions at the time.—C. G. G.]

Of course, the Wasp engine is much smaller in size an displacement than the Jupiter,—about 1,340 cubic inches displacement as compared with 1,750 cubic inches. Naturall the head-resistance is considerably less. The guarantee power of the new Wasp is 450 h.p. at 2,100, although th average engine develops reasonably in excess of this guaranty

The Pratt and Whitney Hornet and the Jupiter are o approximately the same displacement and size. We do no recommend the Hornet for installation in the single and two-seaters. It was primarily developed for the weight-carryin ships and is furnished in both the direct-drive and geare types. It is believed that a radial of this size is at some disadvantage in regard to high speed in the smaller ships.

I have no intention in this letter of trying to cover all th arguments which enter pursuit or high-speed equipment. Th requirements of this field change too rapidly to come to to definite conclusions. There is undoubtedly a place for shee high-speed planes whose only requirement is speed.

To obtain the ultimate in this class it may be advisable t use 800 or even 1,000 h.p. This sets up power plant problem for pursuit entirely different from that which we have a this time, and may require an entirely new type of engine particularly for the air-cooled competitor.

From the standpoint of Commercial Aviation, we believ that the air-cooled radial offers greater advantages than an other type. There seems little argument in commercial aviation as between air-cooled and water-cooled engines. Th weight-saving of the former has definitely determined th issue.

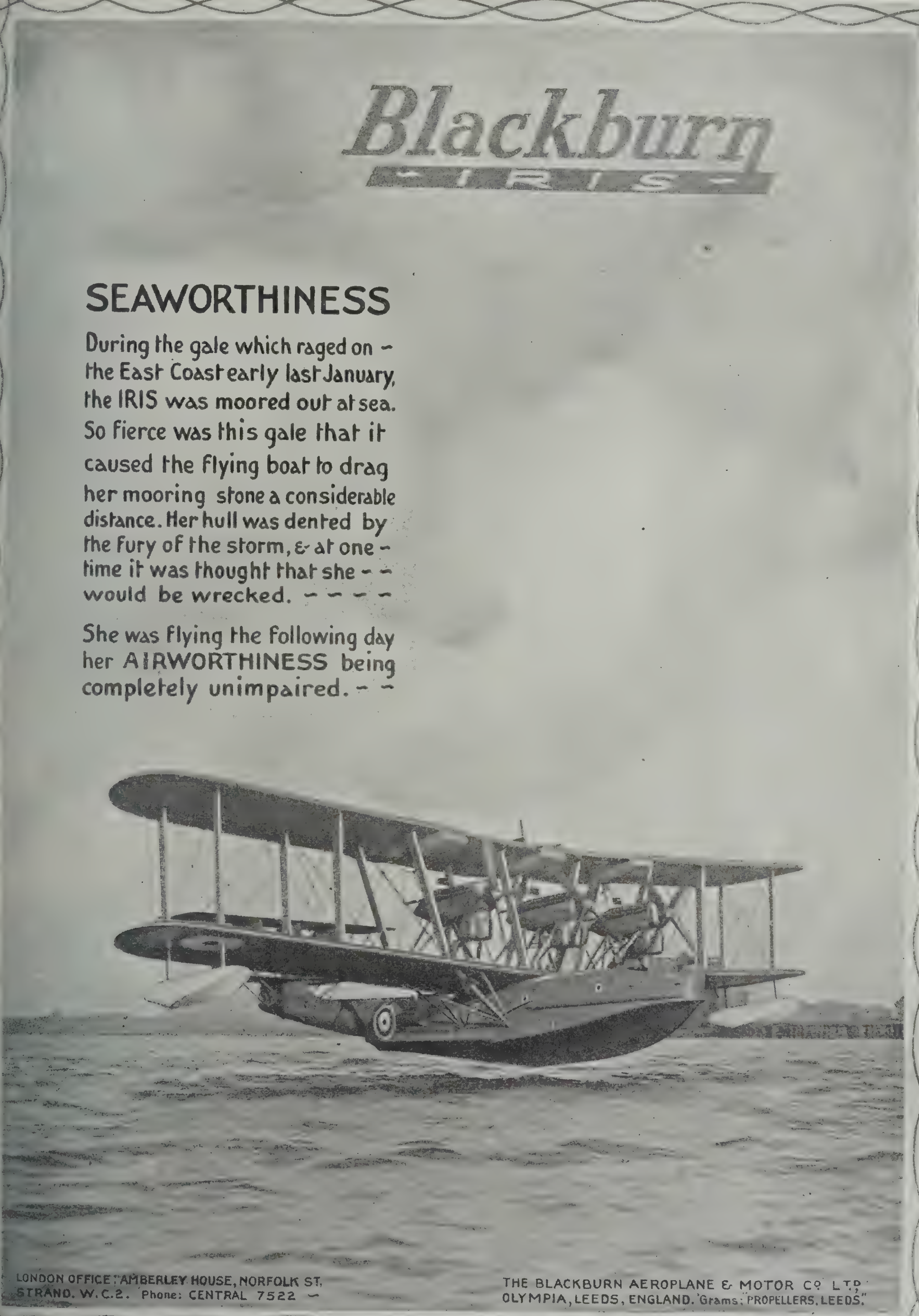
The radial offers certain advantages over other types o air-cooled engines which are difficult to offset, namely : firs cost, maintenance, simplicity, ease of installation, etc. Moreover, the radial will probably weigh less than any other air-cooled type of equal displacement. The radial is a comparatively simple manufacturing type because of the simpl crankshaft construction and the multiplicity of identical part as compared with a Vee-type engine.

After experience in the manufacture of both types, I shoul say that the radial should cost about fifty per cent. less tha the average Vee-type engine of equal size. It also lend itself better to quantity production because the tooling up i so much simpler.

Only time will fully determine certain of the answers It is difficult to obtain facts, and, given the same facts t work with, most of us come to different conclusions. Al of this is probably very helpful for general development. I is certainly true that all types of power-plants have bee tremendously improved in the past seven or eight years which is, after all, the thing of principal interest.

F. B. RENTSCHLER.

AN AIR INSPECTION.—Sir Philip Sassoon, the Under-Secretary of State for Air, at the Ciampino aerodrome near Rome on April 7. On his right is Signor Balbo, the Italian Under-Secretary for Air, and on his left General the Marchese de Pinedo.



Blackburn
- IRIS -

SEAWORTHINESS

During the gale which raged on the East Coast early last January, the IRIS was moored out at sea. So fierce was this gale that it caused the flying boat to drag her mooring stone a considerable distance. Her hull was dented by the fury of the storm, & at one time it was thought that she would be wrecked. - - - -

She was flying the following day her AIRWORTHINESS being completely unimpaired. - -

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CANADIAN AIR MAIL CONTRACTS.

According to *The Times* the Canadian Government, encouraged by the success of the experiments last year, when aeroplanes met incoming steamers at Father Point and conveyed the mails inland, has awarded four contracts for air-mail services to permanent lines.

The Canadian Trans-Continental Airways, Limited, will furnish a service on four days a week between Father Point and Montreal and twice a week between Montreal and Ottawa. The Canadian Airways Limited, gets a contract for a four-day-a-week service between Montreal and Toronto, and the Canadian and Colonial Airways Limited for a daily service between Montreal and Albany, New York State, where connections are being arranged for a trans-continental aerial service through the United States. The rate to be paid under these contracts averages $1.25 (5s.) per flying mile.

THE ITALIAN POLAR FLIGHT.

On April 3 the Italian exploration steamer *Citta di Milano* which is to be the parent ship of the Italian Trans-polar airship flight from King's Bay, Spitzbergen, arrived at Plymouth to re-fuel and renew her supplies of provisions and water.

The airship to be used is a development of the "Norge" which was used by Capt. Amundsen for his flight over the North Pole in 1926. It has been designed by General Umberto Nobile, who has been responsible for all the "N" type airships produced by the Italian State Airship factory at Rome.

The new ship, which has been christened the "Italia," has a capacity of 700,000 cub. feet.

The *Citta di Milano* which belongs to the Hydrographic Department of the Italian Navy has been specially strengthened to contact with ice. She carries 4,500 cylinders of hydrogen for the airship, which it is intended shall make three flights of long duration in the Polar regions. One of these will be to the North Pole, and the others to the north-east and north-west, while there may also be several shorter flights from the base. The steamer carries an elaborate wireless outfit, so that she will be continuously in touch with Rome.

General Nobile, with 19 passengers and crew, left Milan at 01.30 hrs. on April 15 on the Italian airship "Italia" on the start of the expedition to the Arctic regions. She arrived at 08.35 hrs. on April 16 at Stolp, in Pomerania, where the ship is due to remain for two weeks. The distance from Milan to Stolp is 800 miles. She will then proceed to her base in Spitzbergen.

General Nobile hopes to make a landing in the region of the North Pole itself. The surface there is said to be frozen sea, in which case a landing may be comparatively a simple affair.

Two or three flights will be made, and it is hoped to bring the airship back to her Spitzbergen base between each.

AIR AND GAS IN RUSSIA.

The correspondent of *The Times* writing from Riga on Apr. 2 said that at the opening of the annual congress of the Osoaviakhim (the Soviet organisation for promoting aviation and gas warfare) at Moscow, Rykoff declared *inter alia* that the Soviet Government was "determined to redouble its efforts to militarise the whole of the U.S.S.R."

The foreign Press, Rykoff continued, had made a loud noise about the close connection between this organisation and the Red Army, but this would not daunt them. The question of the militarisation of the country must continue to occupy most of their energy, as the Imperialists intended to fall on the U.S.S.R., and a relaxation of effort was unthinkable. Geneva was an eloquent demonstration of the capitalists' war thirst.

Voroshiloff, the Commissar for War, who then addressed the Congress, regretted that they had not realised their hopes of the past year. their membership in 1927 was two millions. "We said we would double or treble it before 1928, but it is now only three millions. We tried our hardest, but we must confess to a certain disappointment. We must strive to increase the pace of development during the present year." Rykoff was right, Voroshiloff continued, when he said, "We tried to disarm the Imperialists at Geneva." The results were as good as could be expected. "We manœuvred well, and we made a loud demonstration of willingness to disarm. Now we must increase our military strength in every direction."

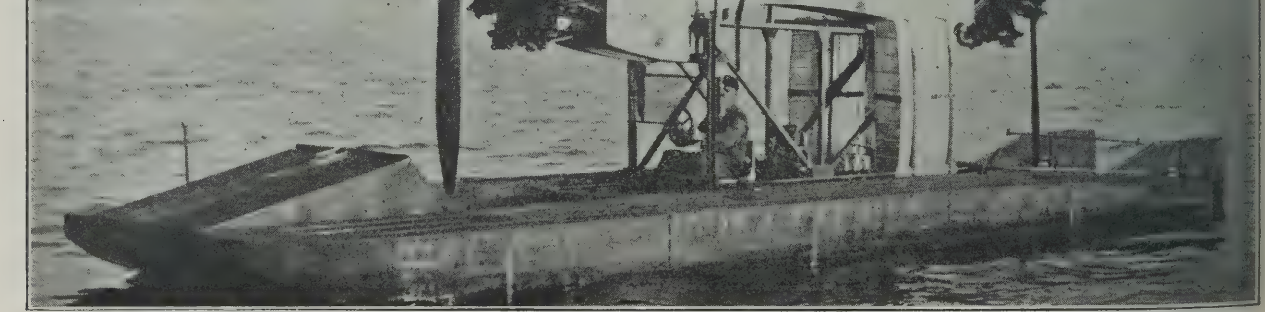
Voroshiloff laid emphasis on the necessity of new and active members recruiting for the Osoaviakhim, particularly from amongst the ex-soldiers, "thus killing two birds with one stone": gaining members who understood military matters and amplifying the Red Army's reserves with an organised body of really trained men. They had powerful auxiliaries in the Communist Party and the Red trade unions, which now helped more than formerly.

THE BUSK STUDENTSHIP IN AERONAUTICS.

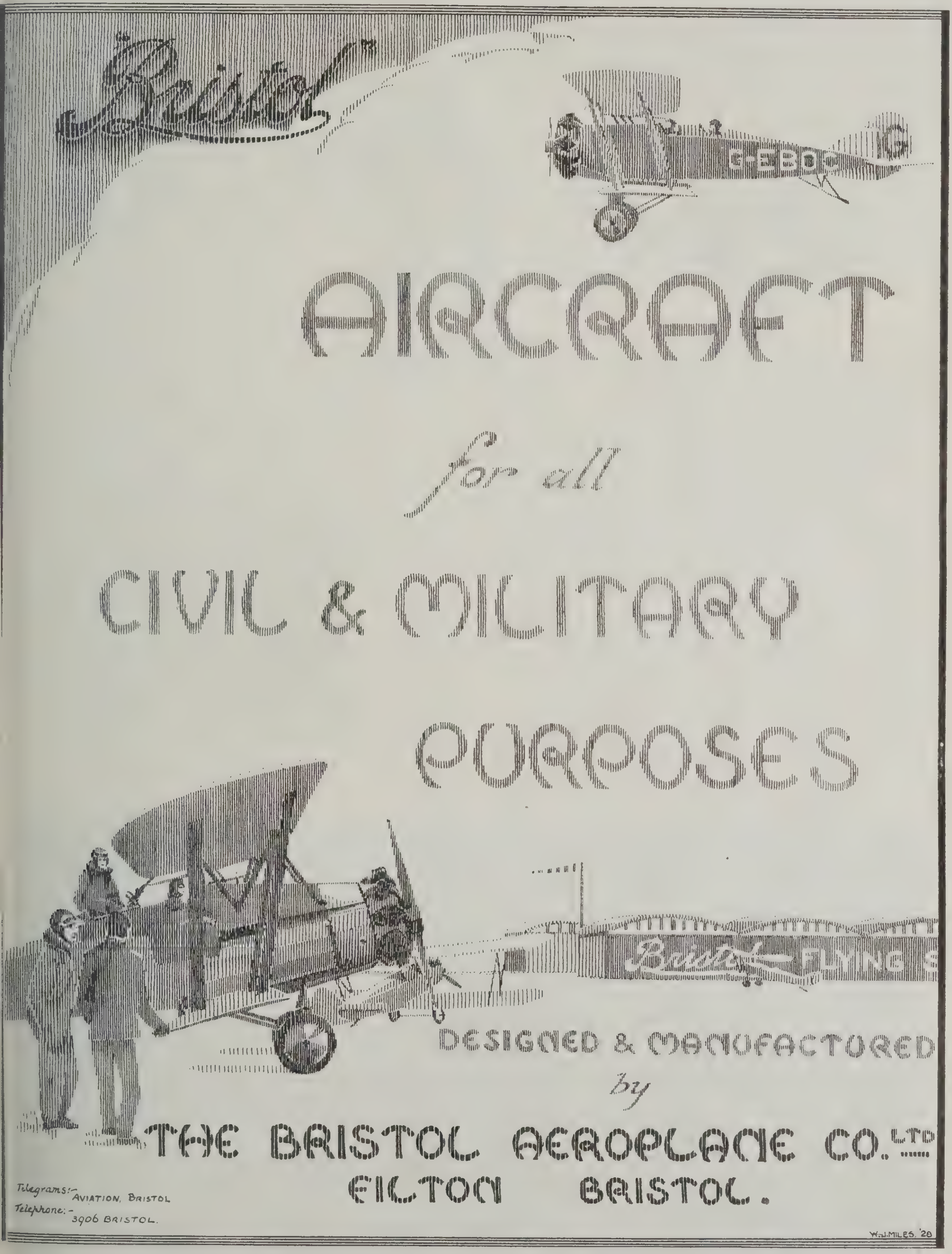
The Trustees of the Studentship in Aeronautics established in memory of Edward Teshmaker Busk, killed in 1914 while flying an experimental aeroplane, announce that, a vacancy having arisen for the current year, they are prepared to receive applications for appointment thereto. All necessary forms and information may be obtained on application to Prof. B. Melville Jones, at the Engineering Laboratory, Cambridge.

The Studentship is of the value of £150 and is tenable for one year from Oct. 1. It is open to any man or woman being a British subject and of British descent who is under 25 years of age on Oct. 1. The object is to enable the holder to engage in research, or in preparation for research in Aeronautics, and particularly in those subjects such as stability problems, meteorological questions bearing on flight, or the investigation of gusts in which Edward Busk was specially interested.

Applications for this Studentship on the forms provided must be lodged with Prof. Jones at the address given not later than May 12.



A NOVEL TEST-BED.—This photograph shows one of the two sets of power-plant, each consisting of two geared Jupiter engines, and their accessories, of the new Dornier Super-Wal mounted in a hydroplane for tests of the installation and gearing of these engines. This floating test-bed has had over 100 hours of running at speeds over the water up to 75 m.p.h



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THE ROYAL AIR FORCE.

The London Gazette.

April 13.

General Duties Branch.—The following Plt. Offs. are promoted to the rank of Flg. Off. :—E. T. M. Smalley (Oct. 12, 1927); B. G. Farrow (Jan. 17); C. K. T. Hughes (Mar. 18).

Flt. Lt. E. C. Usher is placed on the retired list on account of ill-health (Apr. 11). The following Flg. Offs. resign their S.S. comns. :—H. Hollick-Kenyon (Mar. 18); S. R. Sunnucks (Apr. 1).

G. E. Wildman-Lushington, Capt., R.M., Flt. Lt., R.A.F., relinquishes his temp. comn. on return to duty with the Royal Marines (Apr. 9); Flg. Off. W. B. Causer relinquishes his S.S. comn. on account of ill-health (Apr. 11).

Stores Branch.—Flg. Off. W. J. Eagle is transferred to the Reserve, Class B (Apr. 7).

Medical Branch.—Flg. Off. P. H. Perkins is granted a perm. comn. in this rank (Apr. 14).

Chaplains Branch.—The Rev. G. L. Robinson, D.S.O., is granted the relative rank of Group Capt. on appointment as a Staff Chaplain (Apr. 12).

Reserve of Air Force Officers.—General Duties Branch.—Flg. Off. F. E. Bridges relinquishes his comn. on account of ill-health, and is permitted to retain his rank (Apr. 11).

Auxiliary Air Force.—General Duties Branch.—No. 600 City of London (Bombing) Squadron.—The following Plt. Offs. to be Flg. Offs. :—G. W. H. Wallcousins (Feb. 3); W. R. Massey (Feb. 28). No. 605 County of Warwick (Bombing) Squadron.—The following to be Flg. Off. :—J. P. Huins (Mar. 1).

Appointments.

Week ending April 16.

General Duties Branch.—Wing Commanders A. J. Miley, O.B.E., to R.A.F. Depot, Uxbridge, Supernumerary on ceasing to be seconded to the Chilean Navy, 1/4. B. L. Huskisson, D.S.C., to H.Q., Coastal Area, Supernumerary, 20/3. E. Osmond, C.B.E., to H.Q., R.A.F., Mediterranean, for Air Staff duties, 22/3.

Squadron Leaders G. C. Bailey, D.S.O., to R.A.F. Depot, Uxbridge, 28/2. H. M. Probyn, D.S.O., to No. 2 Sqdn., Manston, 17/3.

Flight Lieutenants H. N. Hampton, D.F.C., to No. 2 F.T.S., Digby, 12/4. A. S. Cheshire, M.B.E., to No. 4 F.T.S., Middle East, 30/3. W. G. E. Hayman, to H.Q., Transjordan and Palestine, 30/3. C. E. Barraclough, to No. 4 F.T.S., Middle East, 30/3. F. H. Ronksley, M.C., to No. 2 Arm. Car Co., Middle East, 30/3. H. J. Brown, to No. 2 Arm. Car Co., Middle East, 30/3. A. T. K. Shipwright, D.F.C., to H.Q., Transjordan and Palestine, 30/3. F. M. F. West, V.C., M.C., to R.A.F. Base, Malta, 30/3. H. G. W. Lock, D.F.C., to No. 84 Sqdn., 'Iraq, 30/3. R. J. H. Holland, to H.Q., 'Iraq Command, 30/3. J. N. Boothman, to No. 55 Sqdn., 'Iraq, 24/2. F. Woolley, D.F.C., to H.Q., 'Iraq Command, 30/3. E. S. Burns, to H.Q., R.A.F., Mediterranean, 30/3. E. C. Barlow, to No. 30 Sqdn., 'Iraq, 23/3.

Flying Officers W. G. Jones, W. G. Campbell and F. J. Moon, to No. 8 Sqdn., Middle East, 30/3. R. T. Read, to No. 47 Sqdn., Middle East, 30/3. H. L. Patch, to No. 45 Sqdn., Middle East, 30/3. P. R. Stroud and S. M. Thomas, to R.A.F. Depot, Uxbridge, 10/3. A. Maughan, to Aircraft Depot, 'Iraq, 30/3. F. S. Hodder, to No. 6 Sqdn., 'Iraq, 30/3. W. C. McNeil, to No. 481 Flight, Malta, 30/3. U. S. Mackay, to No. 84 Sqdn., 'Iraq, 30/3.

Pilot Officers F. G. Fairhead, to Aircraft Depot, 'Iraq, 30/3. C. W. Grannum, to No. 481 Flight, Malta, 30/3. A. R. Sarel, to No. 480 Flight, Calshot, 27/3. C. K. Turner, to No. 5 F.T.S., Sealand, 3/4. H. P. Wilson, to No. 5 F.T.S., Sealand, on appointment to a S.S Comn., 2/4.

Stores Branch.—Squadron Leader W. J. B. Curtis, O.B.E., to R.A.F. Depot, Uxbridge, 10/3.

Flight Lieutenant T. A. G. Hawley, to R.A.F. Depot, Uxbridge, 17/2.

Flying Officers E. G. Jolliffe, to R.A.F. Base, Malta, 30/3. C. J. Nobbs, to R.A.F. Depot, Middle East, 30/3.

Accountant Branch.—Flight Lieutenants R. Byrne, M.C., to H.Q. Aden Command, 21/3. F. O. Hall, to No. 45 Sqdn., Middle East, 16/3. H. G. Bushell, to Command Accounts Office, 'Iraq, 15/3.

Flying Officer D. J. Sherlock, to Command Accounts Office, 'Iraq, 19/3

Chaplains Branch.—The Rev. C. W. Hall, to Station H.Q., Heliopolis, 1/3.

The 1928 Cairo—Cape Town Flight.

The annual Service flight under the command of Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., which left Heliopolis on Mar. 1, and reached Cape Town on Mar. 24, arrived at Buluwayo on Apr. 10, accompanied by a Squadron of the South African Air Force. Both units reached Broken Hill, Rhodesia, on Apr. 13.

The Long Distance Navigation Exercises.

The long distance navigation exercises of the night-bombing squadrons of the Wessex Bombing Area, R.A.F., began on Apr. 10. The Squadrons taking part were No. 7 and No. 58 Squadrons from Worthy Down and No. 9 Squadron from Manston and No. 99 Squadron from Upper Heyford. Each Squadron was represented by eignt machines.

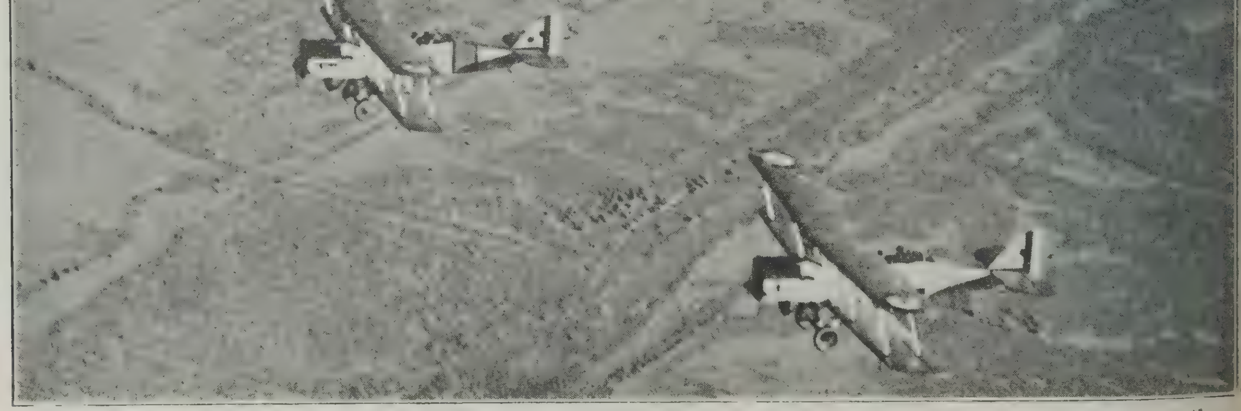
The course was laid over Worthy Down, Bicester, Bircham Newton and Eastchurch, a total distance of 357 miles. Each machine had to fly round the course in a clockwise direction once. One machine from each aerodrome started simultaneously except in the case of Worthy Down where there was a time interval of about half an hour between the start of the machines of the two Squadrons stationed there. Some of the machines were flying at night, some during dusk and daylight, and some partly at night and partly at dawn.

The maximum number of marks which might be scored by each aircraft was 200 divided into 80 for reliability, 80 for air pilotage, and 40 for signals. Penalties were deducted for forced landings, navigational errors, inaccurate log-keeping, delays in starting and errors in W/T signals.

The position of the machines during the trials were plotted on maps at Headquarters from umpires' reports and wireless messages.

The machines left at intervals of four hours. The first aircraft of each of the four Squadrons left their respective aerodromes at 15.00 hours on Apr. 10, and successfully completed the course. Heavy rain fell in Essex and Kent from 18.00 hours onwards. Of the machines which left at 19.00 hours only one completed the course, the other three being forced by bad weather conditions to land at the various emergency grounds which had been provided along the line of the route. These three machines landed without damage to aircraft or crews. At 23.30 hours operations were cancelled for the night owing to the bad weather.

Owing to the continued bad weather the operations were cancelled on Apr. 16. Three machines did not complete the trials.



OVER THE WAHABI COUNTRY.—A formation of D.H.9as of No. 84 (Bombing) Squadron flying over the desert in Southern 'Iraq.

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Ethyl Petrol is sponsored by the largest motor manufacturers in the world. It cannot injure spark plugs, valves, or stems, or damage the engine in any respect whatsoever. It does not create carbon.

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"There had been three inquiries into the question of this spirit in the United States. Those committees had not found any actual evidence that harm had resulted from the ordinary use of Ethyl petrol. They did recommend that certain precautions should be adopted in regard to its manufacture and distribution in the garages. Before condemning the Ministry of Health the experience of the United States should be taken into consideration. During the whole of the five years in which the spirit had been in use there, no one had been able to discover a single case of lead poisoning resulting from the use of this substance, although its consumption ran into several hundred million gallons a year."

VISCOUNT GAGE
in the
HOUSE OF LORDS
March 29, 1928.

[*Extract from "The Times" 30/3/28*]

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D.A. 140

The Wahabi Raids on 'Iraq.

The Times correspondent in Baghdad, in a message dated April 13, states :—

Members of the 'Iraq Cabinet state confidently that further Akhwan (Wahabi) attacks are not expected. Mr. Cornwallis, Adviser to the Ministry of the Interior, is joining the Conference between Ibn Saud and Sir Gilbert Clayton at Jeddah.

Sir Henry Dobbs, the High Commissioner, in conversation to-day, said that now there was even less cause for anxiety than before. The latest news showed that so profound was the effect produced by the R.A.F. bombing on the Mutair, who raided Jarishan on Feb. 15, that they and their leader, Feisal ed Dowish, had, for a time at all events, abandoned all idea of making fresh raids. There had been rumours that the Ateibah tribe were contemplating a raid, but it appears that messengers from Ibn Saud managed to dissuade them. In the meantime the 'Iraq Government had organised a very useful force of armed cars, which had gone out into the desert to patrol the main avenues of approach and to reassure the 'Iraq tribes.

The recent great improvement in the situation, said Sir Henry, was a striking justification of the dignified and composed attitude of the Euphrates population, who showed no signs of panic, and were from the first convinced that the efforts of the R.A.F., together with the 'Iraq Army's defensive preparations, would succeed in preventing any serious attack. The only grave injury done to 'Iraq, he continued, had been inflicted by wild reports manufacturing scare after scare. These messages at first produced such an effect upon British and European opinion that plans under discussion for the investment of European capital in 'Iraq were rudely checked and the general credit of 'Iraq impaired, and several European firms having branches in 'Iraq had, he believed, in consequence of these reports, incurred heavy expenditure in special insurance of their premises and businesses against risks of war and internal commotion. The scare had for a time unsettling effects upon the Kurdish districts. The reports were now, however, completely discredited.

Modern Languages in the R.A.F.

Air Ministry Orders announce that courses in Arabic and Persian will begin at the School of Oriental Studies, London, next October. Two officers of the R.A.F. will be selected to attend each course. One officer will also be selected to attend a course in Russian at King's College, London University, beginning in October next. Officers attending these courses will be regarded as on duty, and will receive full pay and allowances during the courses. Officers desiring to attend should submit their applications through the usual channels.

Air and other Officers Commanding, in forwarding applications should state whether they are recommended, and giving full particulars of any special qualifications possessed by the officers concerned. For example, aptitude for languages, staff duties, etc. Volunteers should hold permanent commissions and be not over 30 years of age on Oct. 1, 1928.

An Air Ministry Order states that the following officers and airmen passed the examination at the centres and on the dates specified in the following list :—

LONDON, JAN. 17, 1928 :—

French (Preliminary) : Wing Cdr. E. W. Havers, Sq. Ldr. R. M. Bayley, Flt. Lt. P. R. T. J. M. I. C. Chamberlayne, Flt. Lt. R. J. M. de St. Ledger, No. 332406 Cpl. D. Edwards.

French (Interpreter 2nd class) : Wing Cdr. C. G. S. Gould, Flt. Lt. A. B. Wiggin, Flt. Lt. W. Elliott.

German (requalification as Interpreter 1st class) : Flt. Lt. B. J. Silly.

'IRAQ, JAN. 17-19, 1928 :—

French (Preliminary) : Flg. Off. C. H. Johnson.

Turkish (Preliminary) : Sq. Ldr. K. C. Buss.

MIDDLE EAST, JAN., 1928 :—

French (Preliminary) : No. 346503 Cpl. H. A. J. Scognamillo.

German (Preliminary) : No. 357538 L-AC. R. H. Linder.

Russian (Interpreter 1st class) : Plt. Off. W. G. Cheshire.

Arabic (Preliminary) : Flg. Off. S. C. George.

Arabic (Colloquial) : Flt. Lt. L. de L. Leder, No. 349273 L-AC. C. Turner, No. 352050 L-AC. F. R. W. Goodall, No. 346503 Cpl. H. A. J. Scognamillo, No. 346350 Cpl. J. Robertson.

INDIA :—

Urdu Qualifying Examination : Flg. Off. R. H. Holmes (Oct. 3, 1927).

British Service Officers' Urdu Test : Sq. Ldr. C. C. Darley, A.M. (July 4, 1927), Flg. Off. (Hon. Flt. Lt.) L. S. Hamilton (Oct. 3, 1927).

Flying Training Assessments.

An Air Ministry Order states that the following airmen have been awarded special assessments on completion of a course of *ab initio* flying training at No. 2 Flying Training School, Digby :—

Special Distinction : No. 362196 L-AC. A. H. Tompkins.

Distinguished Pass : No. 326289 L-AC. G. F. Collins and No. 359131 L-AC. F. G. Bamford.

The R.A.F. Display Poster 1928.

The winner of the competition for the design of a poster for the R.A.F. Display 1928 was Flg. Off. W. E. Johns, Reserve of Air Force Officers.

The runners-up in the competition were Mr. E. E. Cracknell, Royal Airship Works, Cardington; Group Capt. H. Cooper, D.S.O., B.A., H.Q., Air Defence of Great Britain, and Mr. S. C. Hart-Still, Royal Airship Works, Cardington.

This is the second year that the competition for the R.A.F. Display poster has been won by Mr. Johns, who is now the leading spirit of the Aircraft and Fine Art Publishing Company, of East Grinstead. In 1926 the competition was won by Mr. L. Bridgman of THE AEROPLANE, and in 1925 it was won by Flg. Off. A. B. Cree, Reserve of Air Force Officers, who is now serving with the Northern Rhodesia Police in Livingstone, N. Rhodesia.

Squadron Leader A. R. Arnold.

Sq. Ldr. A. R. Arnold, D.S.C., D.F.C., whose appointment to command No. 17 (Fighter) Squadron, Upavon, is dated Mar. 31, was born in 1896 at Tattenhall, Chester, and educated at Twyford School, Malvern College, and the Merchant Venturers' Engineering College, Bristol. He entered the Royal Naval Air Service as a probationary sub-lieutenant in August 1914, and learned to fly on a Maurice Farman biplane at the Central Flying School at Upavon. His Royal Aero Club certificate, No. 876, is dated Aug. 21, 1914. He served first at Chingford, and was appointed Flight Lieutenant R.N.A.S. in December 1914. He became a Flight Commander in June 1916 and Squadron Commander in December 1917. He served with R.N.A.S. Units at Dover, when he was severely injured while landing a Maurice Farman in the dark near Chelmsford after chasing a Zeppelin, and at Dunkirk from March 1917 to April 1918, and with the Army in France, when he commanded with distinction a fighter squadron, from June 1918 until April 1919. He was awarded the Distinguished Service Cross in 1918 in recognition of distinguished services in Dunkirk, and the Distinguished Flying Cross in 1919 in recognition of distinguished services during the War. He was also awarded the Belgian *Croix de Guerre*. After the Armistice he was appointed to the Staff of the Directorate of Operations and Intelligence, and in 1922 he became Personal Assistant to Sir John Higgins, Air Officer Commanding Inland Area. In February 1924 he was posted to 'Iraq for Air Staff Duties at Headquarters 'Iraq Command, again under Sir John Higgins. He was restored to the Home Establishment in April 1927, and appointed to command the R.A.F. Practice Camp at Sutton Bridge. While there he was taken ill, and for some

A REMINISCENCE OF 1926.—Two Vickers Victorias (two Napier Lion engines) of No. 216 (Bombing) Squadron at Aden after their flight from Heliopolis in 1926. No. 216 Squadron is commanded by Wing Cdr. L. D. D. McKean, O.B.E.

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ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew across the **NORTH ATLANTIC** *in* 1919.

ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew from **ENGLAND** *to* **AUSTRALIA** *in* 1919.

ROLLS-ROYCE AERO ENGINES in a Vickers-Vimy aeroplane flew from **ENGLAND** *to* **SOUTH AFRICA** *in* 1920.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew across the **SOUTH ATLANTIC** *in* 1922.

ROLLS-ROYCE AERO ENGINES in a Fairey seaplane flew round **AUSTRALIA** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Fokker monoplane flew from **HOLLAND** *to the* **EAST INDIES** *in* 1924.

A ROLLS-ROYCE AERO ENGINE in a Handley-Page aeroplane flew from **BRUSSELS** *to the* **BELGIAN CONGO** *in* 1925.

ROLLS-ROYCE AERO ENGINES in Dornier-Wal flying boats flew from **MOROCCO** *to* **SPANISH WEST AFRICA** *in* 1926.

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months was a patient in the R.A.F. Hospital at Halton, where he underwent a serious operation. On his recovery he was appointed to command No. 17 Squadron.

The R.A.F. Birthday Number.

Careful readers of The Aeroplane have kindly drawn attention to the following errors and omissions in the R.A.F. issue of The Aeroplane of April 4 :—

A letter from No. 19 (Fighter) Squadron points out that the Sir Philip Sassoon Cross-Country Flying Challenge Cup was not won entirely in 1927 by No. 41 Squadron, because the result of the competition was a draw between No. 41 (Fighter) Squadron and No. 19 (Fighter) Squadron.

Another correspondent, referring to the photograph of a detachment of No. 30 (Bombing) Squadron on active service, explains that the photograph shows Sq. Ldr. H. P. Lale, D.S.O., D.F.C., and not, as stated, Sq. Ldr. F. H. Coleman, D.S.O. Sq. Ldr. Lale took over the squadron in December 1927.

An Education officer in the R.A.F. calls attention to the omission of any mention of the formation of No. 2 Technical Training School (Boys) in 1920, which was the beginning of the present Aircraft Apprentice system. The same writer also points to the error in transcription which stated that in 1925 Air Vice-Marshal Higgins was appointed K.C.B. This should read "K.B.E."

R.A.F. SPORTS AND PASTIMES.

The R.A.F. Miniature Rifle League.

Details of the results of the R.A.F. Miniature Rifle League Competition for 1927-8 have been received from Flt. Lt. J. L. K. Pearce, O.B.E., Secretary of the R.A.F. Rifle Association.

The Miniature Rifle League was organised in 1926 for competition amongst Units of the R.A.F. stationed at home and has for its objects : (1) To keep trained personnel in touch with rifle shooting during the winter months : (2) to train young shots : (3) to provide a useful service form of recreation throughout the winter, and (4) to raise the standard of musketry, voluntarily throughout the Service.

Nobel Industries Ltd. have presented the League with a silver challenge cup and ten silver medals for the winners and ten bronze medals for each of the second and third teams.

The competition is organised in two stages. In the first stage the Units in each group or area shoot on the League principle, each team within the group or area shooting against each other. The second stage is run on the knock-out principle, each group or area being allowed to enter the best team of each four teams in the first stage.

The first stage began in October, 1927, and ended in February, 1928. In this stage Inland Area entered 17 teams and the four winners were Sealand, Eastchurch, Henlow and No. 2 (A.C.) Squadron. Fighting Area entered 12 teams and the winners were No. 23 (F) Squadron, No. 24 (C) Squadron and No. 32 (F) Squadron. Bombing Area entered 8 teams and the winners were No. 9 (B) Squadron and No. 39 (B) Squadron. Cranwell entered 4 teams and the winners were Cranwell "A" team.

The results of the second stage were as follows :—

First Round.—Eastchurch (1,520) beat Henlow (1,507); No. 23 Sqdn. (1,527) beat No. 9 Sqdn. (scratched); No. 39 Sqdn. (1,462) beat No. 24 Sqdn. (1,461); No. 32 Sqdn., bye; Cranwell (1,490) beat No. 2 Sqdn. (scratched); No. 5 F.T.S., bye.

Second Round.—No. 23 Sqdn. (1,519) beat Eastchurch (1,492); No. 39 Sqdn. and No. 32 Sqdn., byes; No. 5 F.T.S. (1,523) beat Cranwell (1,508).

Semi-final.—No. 23 Sqdn. (1,527) beat No. 39 Sqdn. (1,486); No. 5 F.T.S. (1,510) beat Cranwell (1,506).

Final.—No. 23 Sqdn. (1,545) beat No. 5 F.T.S. (1,514).

The winners, No. 23 (Fighter) Squadron maintained a very high standard throughout the second stage, averaging 1,529.5 in their four shoots, or an average of nearly 95.6 per man. This constitutes a record in this League and their score of 1,545 in the final beats last year's winners' score by 41 points. The team and their individual scores were :—

Flg. Off. Gardner, 197; L-AC. Lewis, 197; Flt. Lt. Fairweather, 195; Cpl. Smallwood, 194; AC. Crosbie, 193; Flt. Lt. Calvey (Captain of the Team), 191; AC. Corbett, 190; Sjt. Duncton, 188. The Reserves were Flg. Off. Martin, 184, and S-M.1. Frier, 179.

The third place was awarded to Eastchurch (Armament and Gunnery School) on account of their having made the highest score of any team in the second stage other than the finalists.

Association Football.

The Royal Navy versus the Royal Air Force.—The Royal Navy beat the R.A.F. at Portsmouth on Apr. 11 by six goals to one. *The Times* account of the game states :—

The Royal Air Force played very well in the early stages, but as the game wore on it became obvious that they could not maintain the pace set by the Navy, and, in spite of tremendous efforts on the part of their half-backs and some magnificent goalkeeping by L. Quadling, they were a well-beaten team at the finish.

It was not only in the matter of speed that the R.A.F. were beaten. The Navy, who are accustomed to play together, showed a much better combination in the closing stages. Coates, the Navy's inside right, was always the best forward on the field. His ball control and anticipation of how the game was going were excellent, and although he was slightly hurt towards the end he was always too clever for the R.A.F. backs. Burns also was quick to take advantage of the many excellent centres sent in by Chapman. C. E. Glenister was the most prominent member of a hard working half-back line.

The R.A.F. team were :—AC. Quadling (Gosport), goal; AC. Oram (Calshot) and Flt. Lt. S. N. Webster (Martlesham Heath), backs; Sjt. Stewart (Leuchars), Cpl. Baldwin (Uxbridge), and Flt. Lt. B. Ankers (S. Farnborough), half-backs; Sjt. Francis (Upper Heyford), AC. Ewers (Uxbridge), AC. Parrish (Flowerdown), AC. Dicker (No. 5 Training School), and AC. R. Ward (Central Flying School), forwards.

THE ROYAL AUSTRALIAN AIR FORCE.

The following article by the Melbourne correspondent of *The Times* appeared in *The Times* of Apr. 10 :—

For the past two or three years the Commonwealth Government has been endeavouring to strengthen progressively the Royal Australian Air Force. It considers that this development has now reached a stage at which the visit of a senior officer of the Royal Air Force to report upon Australian air defence generally, and especially on the organisation, training, and equipment of the force, would be of great advantage. A request was accordingly made to the British Government for the services of such an officer, and the British Government has granted the services of Air-Marshal Sir John Salmond, who is expected to leave for Australia in May, reaching the Commonwealth in June.

A complete reorganisation of the Australian air defence forces is expected to result from Sir John Salmond's visit. The existing state of the Royal Australian Air Force is not satisfactory. Too little money has been spent on equipment. Most of the machines in use were received as a gift from the British Government at the end of the War. Excepting such small machines as a De Havilland Moth and a D.H.50, the only machines purchased since this gift are six Fairey III.D seaplanes, bought in 1922; nine Supermarine Seagull amphibians, bought in 1923 and 1925; and two Supermarine Southampton flying-boats, which have not yet been assembled. Of the Fairey seaplanes two crashed and became total losses, three are still in use, and the sixth, which Wing Cdr. S. J. Goble flew round Australia in 1924, is in the Australian War Museum. Six of the Seagulls were bought for approximately £10,000 each, and two years later three similar machines were obtained from the Royal Air Force for £100 each, as they had become obsolete in that service. These had been bought to provide spare parts, but they were found so serviceable that they were retained as flying units.

It is expected that equipment such as this will be the subject of severe criticism by Sir John Salmond. The condition of military aviation in Australia at present is comparable to that of the Indian Air Force in 1922, when, following a report on that service by Sir John Salmond, the force was completely reorganised. There are Royal Australian Air Force services in New South Wales and Victoria only. The organisation consists of headquarters in Melbourne, a flying training school at Point Cooke, near Melbourne, an aircraft depôt and one squadron at Laverton, near Melbourne, one squadron and one Fleet co-operation flight at Richmond (N.S.W.), and an experimental section at Randwick (N.S.W.). The permanent flying *personnel* consists of 91 officers and 734 men, with 48 officers and 391 men of the Citizen Air Force in addition. This number will be increased when the new aircraft-carrier H.M.A.S. *Albatross*, launched at Sydney in February, is placed in commission, but it is considered inadequate to the air defence of the Commonwealth. Among the questions referred to Sir John Salmond will be the advisability of establishing additional air defence centres in parts of Australia not now equipped. His investigation is expected to occupy a considerable time.

AIR AFFAIRS IN PARLIAMENT.

LONG DISTANCE FLIGHTS.

In the House of Commons on Mar. 26, in reply to a question by Mr. Day, the Secretary of State for Air said : "Whilst in the case of aircraft carrying passengers for hire a reasonable degree of control by Regulation or otherwise is clearly required, as with all forms of public transport, the policy hitherto pursued as regards aircraft not carrying passengers for hire has been to leave the activities of pilots unrestricted except in so far as may be necessary in the interests of persons and property in the vicinity flown over. As at present advised, I consider that it would be undesirable in principle to take further powers with a view to exercising a more far-reaching and elaborate control over such aircraft. Further, any Regulations issued would present peculiar difficulties in enforcement and would, in consequence, hardly be likely to achieve their object. In these circumstances, I am not prepared to make the change suggested. I may add that neither Colonel Lindbergh nor Mr. Chamberlin in their flights last year from America to Europe carried wireless, and that Mr. Hinkler's recent strikingly successful flight to Australia would definitely have been impracticable had he been required by Regulation to carry wireless apparatus."

ALL-METAL AIRCRAFT.

In the House of Commons on Mar. 29, in reply to a question by Lt.-Cdr. Kenworthy, the Secretary of State for Air made the following statement :—As regards the first part of the question, most of the British aircraft manufacturers have made experimental aircraft of all-metal structure during the past few years, six have brought such aircraft to the production stage, and two have constructed aeroplanes of which the covering as well as the structure was of metal. As regards the remaining parts of the question, I understand that there is at present no British commercial machine in existence or under design which is strictly comparable to the Junker in so far as the latter machine is of all-metal construction and entirely covered in metal, but that the price is no cheaper than that of British-built aeroplanes which will carry the same load. The service in question is not, of course, to be subsidised from the Exchequer, and it is entirely for the South African authorities to decide the type and origin of the aircraft to be employed upon it.

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THE HELE-SHAW—BEACHAM VARIABLE PITCH AIRSCREW.

The paper by Dr. Hele-Shaw and Mr. Beacham, read before the Royal Aeronautical Society on Apr. 12 was almost entirely descriptive of the mechanism of the new variable pitch airscrew devised by the authors which is now being developed by the Gloster Aircraft Co. Ltd.

Many inventors have tackled the problem of producing variable pitch airscrews. There is no very serious difficulty to be overcome except that of devising a light, reliable and easily operated control gear for varying the angle of the blade. The essential feature of the Hele-Shaw—Beacham airscrew is the hydraulic control gear.

The airscrew itself consists of a pair of metal blades mounted in two journal bearings and one ball race to carry the centrifugal force on the blade, so that the blades may rotate in these bearings. On the end of the section of each blade within the housing boss which carries the bearings is a crank-pin which projects alongside the engine airscrew shaft. The crankpin of one blade lies on one side, that of the other on the other side, of this shaft.

Each crank-pin is fitted with a slider-block engaging in slots cut in a cross-head which can be moved backwards and forwards along the airscrew-shaft axis. It is obvious that any such sliding movement of this crosshead will move the crank-pins on the blade roots and will constrain the blades themselves to rotate in opposite senses in their bearings, and thus to change their pitch.

This cross-head is connected to a piston working in a cylinder mounted on the front of the airscrew-boss housing, and oil channels, one opening to each end of the cylinder, are brought through the boss to a pair of circumferential channels which communicate each with one of a pair of unions on a stationary sleeve embracing the rear end of the boss and making an oil-tight joint thereon.

Oil pressure applied to one union will therefore force the piston in one direction and change the blade pitch one way, and pressure applied to the other union moves piston and blades in the opposite way.

To guard against any failure of the hydraulic operating gear a strong spring is fitted so arranged that it will invariably return the blades to normal pitch if the hydraulic pressure does not dictate some other position for them.

To provide operating power a small three-cylinder variable stroke reversible pump of a type similar to that used for Hele-Shaw steering-gears is driven from the engine, and is controlled by a centrifugal governor. This governor in turn can be set by the pilot through a small lever to maintain any desired engine r.p.m.

If the governor is set to any such value of r.p.m. at a time when the airscrew pitch, airspeed of the machine and throttle opening of the engine are such as would cause the engine to run at a higher speed, the engine will run up to over the set speed, the governor will thereupon move the crank-pin of the Hele-Shaw pump in such a direction that oil is sucked out of one side of the cylinder on the airscrew and forced into the other side, in the correct direction to increase the pitch of the blades, and so to pull down the engine r.p.m. As the engine speed falls, the governor returns the crank-pin of the pump, until when the engine speed is precisely that corresponding to the governor setting, the pump ceases to pump in either direction.

If now the pilot closes his throttle, engine speed starts to fall, and the governor at once moves the pump crank-pin in the opposite direction, the pump starts to pump the reverse way, and the blade angle and pitch are reduced until once more the prescribed r.p.m. are reached.

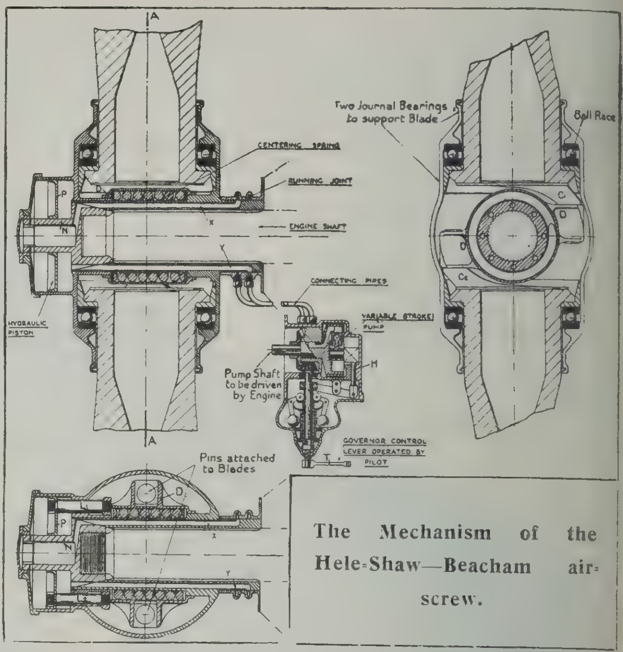
If the pilot wishes to change the r.p.m. of his engine he has merely to re-adjust the governor-setting lever.

The actual arrangement of this ingenious mechanism is shown very clearly in the sectional drawings reproduced. These are not accurate drawings of an airscrew, in that details of construction have been omitted for the sake of clearness, but they are approximately to scale, and do indicate how compact the whole gear is.

Unfortunately the authors were unable to give any information concerning flying results attained with this type of airscrew, as the results of tests under way at Farnborough have not yet been released by the Air Ministry.

In a long discussion which followed the paper various technical officials of the Air Ministry cast grave doubts on the value of the variable pitch airscrew on account of its added weight and increased cost, and liability to failure of the added mechanism.

Capt. Lynham, who is the R.A.E.'s airscrew expert, led this side of the discussion and suggested that if the increased weight of the variable pitch airscrew were used to provide an engine of increased power a better performance would be obtained with a fixed screw.



The Mechanism of the Hele-Shaw—Beacham airscrew.

The sectional side elevation shows the piston (P) in its cylinder, and the two oil passages X and Y leading to the two ends of the cylinder. The front sectional elevation shows the crankpins (C_1 and C_2) on the blade roots and the lugs on the crosshead (D) which operate them. The piston is connected to the crosshead by the two rods L_1 and L_2 shown in the sectional plan at the bottom of the figure.

In reply to this line of attack Mr. Milner and Mr. Burrows of the Gloster Aircraft pointed out that the airscrew now under test was the first of its type and was heavier than it need have been. In new designs they had reduced the extra weight to one half of that of the present model, and that further improvement in this respect would follow.

Wing Cdr. T. R. Cave-Browne-Cave, and Capt. F. L. M. Boothby, late R. N., as airship experts, maintained the necessity of variable pitch airscrews for airships, whether they were worth while for aeroplanes or not. For airships they wanted reversible as well as adjustable pitch.

All these and several other speakers were agreed as to the ingenuity of the authors' solution of the particular problem.

NEW HISPANO-SUIZA ENGINES.

A number of new engines are in preparation by the Société Française Hispano-Suiza of Bois Colombes (Seine).

The type 57 is a development of the type 52 and is a 12-cylinder 90 degree Vee engine of 130 × 170 m/m. bore and stroke. Its normal horsepower is 500 at 2,000 r.p.m. This engine has also been developed with a reduction gear, believed to be of the Farman type, and two specimens of this engine have been delivered to the Navy for experimental test. With the gear this engine weighs 440 kgs.

The type 61 with a bore and stroke of 150 × 170 m/m. is a development of the type 12 H of 500 h.p. and is a 12-cylinder 60 degree Vee engine with a normal 650 h.p.

The type 50 G, 500 h.p. 12-cylinder W engine, has been developed into a 600 h.p. engine with a bore and stroke of 140 × 170 m/m. which represents an increase of stroke of 20 m/m. over the old engine. All the overall dimensions, with the exception of the height of the cylinders, remain the same. The increase in weight over the old engine is 29 kgs. Most of the components, including the pistons, water-jackets, pumps, valve-gear, etc., are interchangeable with the 300 h.p. Vee and 500 h.p. W engines. This engine has successfully passed its 50-hour type test under the control of the *Section Technique et Industriel de l'Aéronautique.*

The remaining two new engines are of the 6-cylinder-in-line type and both represent a new departure for Hispano-Suiza. The first is a 100 h.p. engine with a bore and stroke of 110 × 140 m/m. and is being developed for installation in light school and touring aircraft. The second is being developed for commercial and advanced school use and with a bore and stroke of 130 × 170 m/m. will develop 250 h.p.

It will be remembered that the Société Française Hispano-Suiza has also acquired the licence to construct the Wright Whirlwind engine in France.

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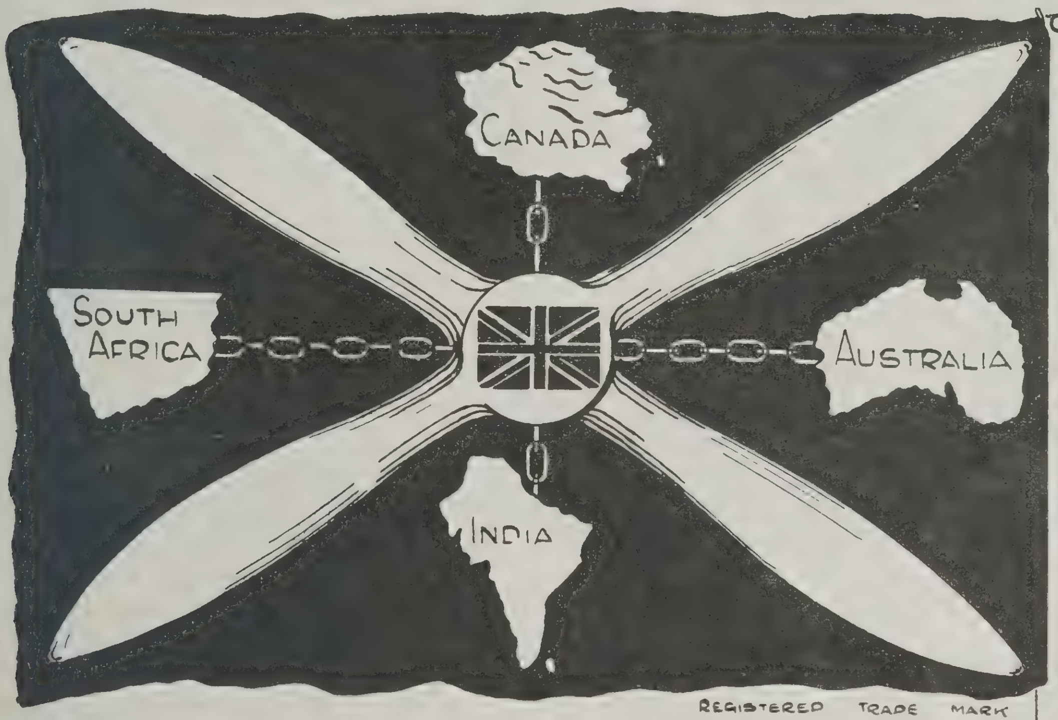

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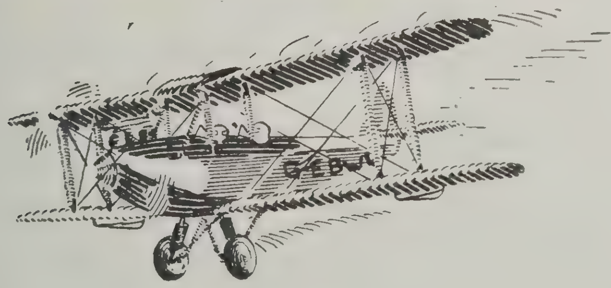

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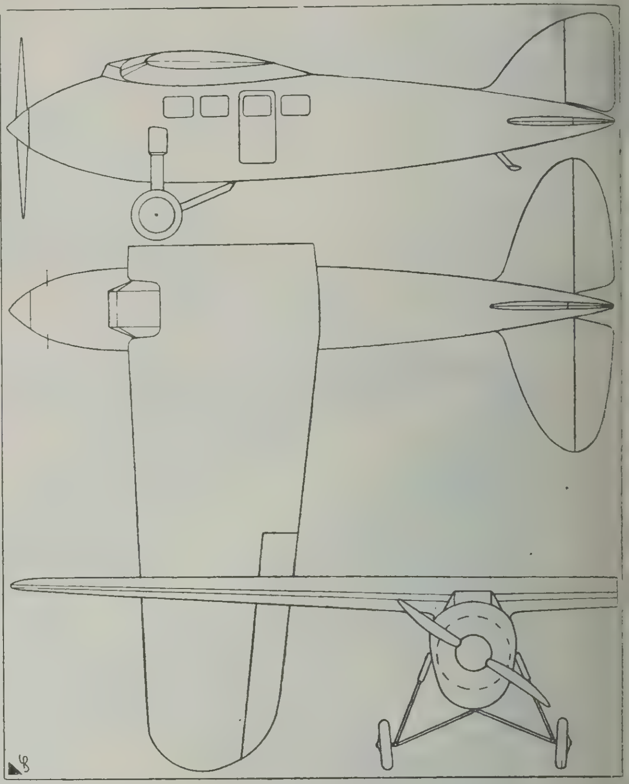
THE LOCKHEED VEGA MONOPLANE.



The Vega monoplane, designed and built by the Lockheed Aircraft Co., of Burbank, near Los Angeles, California, is one more of the many American cabin monoplanes fitted with the Wright Whirlwind engine which have so plentifully been produced in the United States recently. It deserves particular attention, however, because of the novel method used for the production of its fuselage, and because, owing to its unusually clean lines, a remarkably good performance is claimed.

Externally the Vega fuselage looks like a monocoque. Actually it is a bivalve, with the two halves of the shell made of spruce veneers glued together with casein glue, and pressed to shape in a gigantic mould under 150 tons pressure. Once the necessary mould has been produced and the pressing plant laid down it would seem that a shell made in this way would be cheap, accurate as to form and dimensions, and an exceedingly sound job.

The two halves of the shell thus produced are then assembled on a series of oval laminated spruce formers.

The engine-mount, which is of steel, is attached to the forward frame of the fuselage with an intervening fire-proof bulkhead, and is covered with aluminium cowling, thus securing that everything in the engine space shall be of metal.

At the tail end of the fuselage there is a pressed aluminium cone.

As the drawings and photographs show, a remarkably clean outline has been secured by this method of construction, and some care has been taken in the design of other parts of the structure to equal the body in this respect.

For the rest the machine follows already established practice, the wings, being of Fokker type so far as structure is concerned, built on wooden spars and plywood covered.

WINGS.—Cantilever high-wing monoplane. Wing in one piece, tapered in chord and section from centre to tip. Built on two spruce box spars with spruce girder ribs and covered with 3/32 in. three-ply. Wing section Clark "Y" modified.

FUSELAGE.—Spruce veneer shell in two halves formed to shape and glued under pressure, supported by laminated spruce rings.

TAIL UNIT.—Tail plane and elevators together roughly elliptical in plan. Fin and rudder similar in shape but of greatly reduced aspect ratio. All constructed in same manner as wings.

UNDERCARRIAGE.—Split-axle type. Each half axle supported by a telescopic leg with rubber cord and hydraulic shock-absorbers. Junction of axle and telescopic leg braced by thrust tube running back to centre line of fuselage. Lockheed hydraulic wheel brakes built into wheels (30 in. x 5 in.).

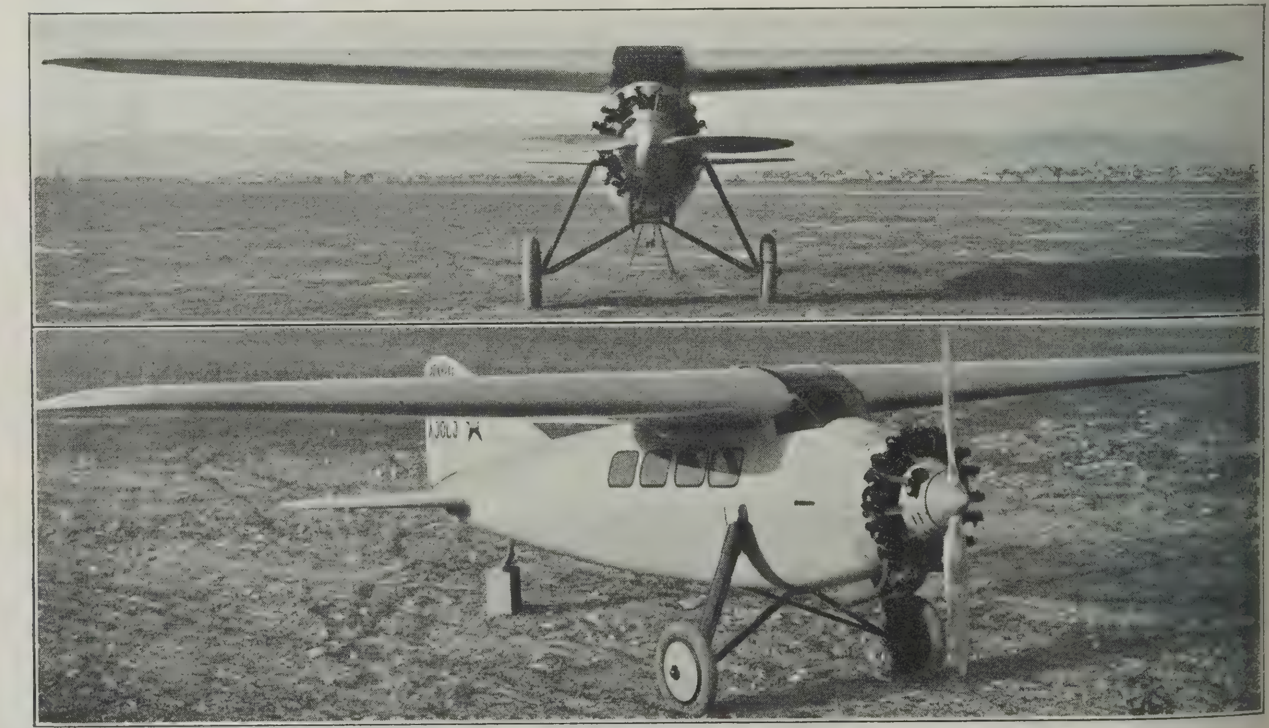
POWER PLANT.—One Wright "Whirlwind" (type J-5) engine 220 h.p. Two 50 gall. (U.S.) fuel tanks in wing giving gravity feed. Jettison valves to tanks.

ACCOMMODATION.—Pilot in open cockpit with his head in a "cut-out" in leading edge of wing. Sloping wind screen up to leading edge level, and a removable (sliding) cover which permit of a total enclosure are fitted. Cabin of 100 cubic ft. (2.8 cub. m.) capacity below wing fitted with side entrance door on port side and four glazed port holes on each side. Four or six seats may be fitted in cabin.

DIMENSIONS.—Span 41 ft. 0 in. (12.5 m.), Length 27 ft. 6 in. (8.37 m.), Wing area 275 sq. ft. (26.5 sq. m.).

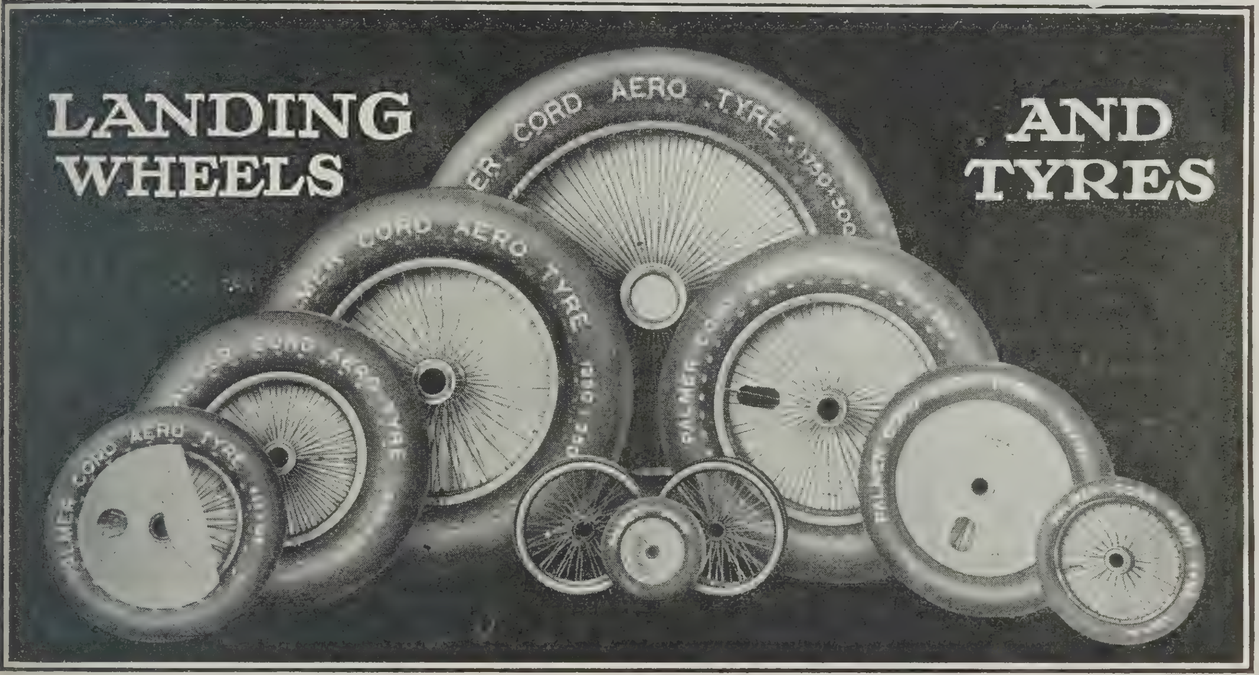
WEIGHTS AND LOADINGS.—Weight empty 1,650 lbs. (750 kg.), Normal fuel (55 U.S. = 46 Imp. gallons = 208 litres) 350 lbs. (159 kg.), Oil 38 lbs. (17.1 kg.), Pilot 180 lbs. (82 kg.), Pay load 700 lbs. (318 kg.), Normal loaded weight 2,918 lbs. (1,330 kg.), Permissible overload weight 3,200 lbs. (1,450 kg.), Wing loading (normal) 10.5 lbs./sq. ft. (5 kg./sq. m.), Power loading (normal) 13.2 lbs./h.p. (6 kg./h.p.).

PERFORMANCE.—Max. speed 135 m.p.h. (218 km.h.), Landing speed 50 m.p.h. (81 km.h.), Climb at sea level 925 ft. per min. (290 metres/min.), Service ceiling 15,900 ft. (4,850 metres), Range with normal load at 110 m.p.h. (177 km.h.) 550 miles (890 km.), Range with full tanks and 3,200 lbs. (1,450 kg.) loaded weight 1,000 miles (1,610 km.).



THE LOCKHEED VEGA.—Two views of the Vega monoplane which show its extremely clean and attractive lines.

PALMER



STANDARD SIZES.

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575×60	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
700×100	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×250	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
975×225	192	185.	60.32	Central
,,	194	185.	55.	125/60
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
,,	191	350.	150.3	Central
1750×350	193	400.	125.	Central

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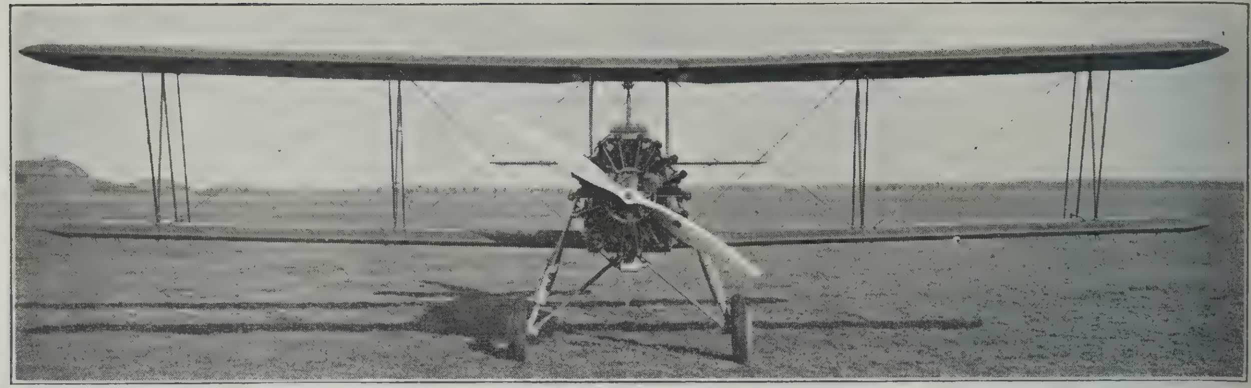


THE CURTISS FLEDGLING.—A front view of the latest production of the Curtiss Aeroplane and Motor Co. The engine is a 230 h.p. J-5 Wright Whirlwind.

A NEW AMERICAN TRAINING MACHINE.

The Curtiss Fledgling is a two-seat training biplane built by the Curtiss Aeroplane and Motor Co., Inc., of Garden City, L.I., N.Y., to fulfil the needs of the U.S. Navy for a machine which will serve for both primary and advanced training either as a land or seaplane. A design competition for this type was held in 1927, which attracted fourteen competing designs, and from these that of the Fledgling was chosen.

The first machine was recently tested at Mitchell Field, Long Island, N.Y., but still remains on the American equivalent of the British Secret List. Consequently only a general description is at present possible.

The general form of the machine can be seen in the photographs which are reproduced It is a normal tractor biplane with two bays of bracing on each side of the wings, "N" type interplane struts, and a moderate stagger. The wings are of standard timber construction.

The fuselage is a rigidly-braced welded steel-tube structure rectangular in section with tandem seats, both behind the wings, for the crew. The rear cockpit has a removable control to be used when dual instruction is being given.

The undercarriage is of the divided-axle type, with compression-rubber springing, and an oleo damping gear.

The engine is a Wright Whirlwind J.5 of 230 h.p. driving a Curtiss-Reed "R" type airscrew.

In order that the machine may be used for all classes of flying training it is equipped with a fixed synchronised Browning gun controlled by the pilot, and a Lewis gun in a Scarff ring over the back cockpit. It has accommodation in the back seat for a bomb-sight with a removable flooring piece from which to take sights, and for bombing training, attachments for standard bomb-racks are fitted to the lower wing.

There is also space aft of the rear cockpit for the installation of a Service type of wireless transmitting and receiving set, and an auxiliary folding seat is provided for the operator when using this for gunnery spotting or the like purposes.

The lay-out of the military equipment follows closely that used in actual Service machines

For use as a seaplane an undercarriage comprising a single central float and a pair of wing-tip floats, all of timber construction, is to be fitted.

The tests so far made show that the machine has an excellent take-off, a top speed of over 110 m.p.h., a rapid climb, and a landing speed of about 45 m.p.h. It has excellent control, even at low speeds, and stunts well, though it is said that it will not spin when stalled unless it is forced to do so by the pilot.

THE CURTISS COURSE OF INSTRUCTION FOR COMMERCIAL PILOTS.

Under the regulations in force in the United States since the beginning of 1927, to qualify for a licence as an industrial or commercial pilot, candidates must be able to show that they have at least 50 hours of solo flying to their credit.

To provide facilities for the acquisition of such licences the Curtiss Flying Service have arranged for an instructional course at Curtiss Field, Garden City, N.Y., which will include 50 hours' flying together with a course of ground instruction which will fit pupils for the Department of Commerce licence.

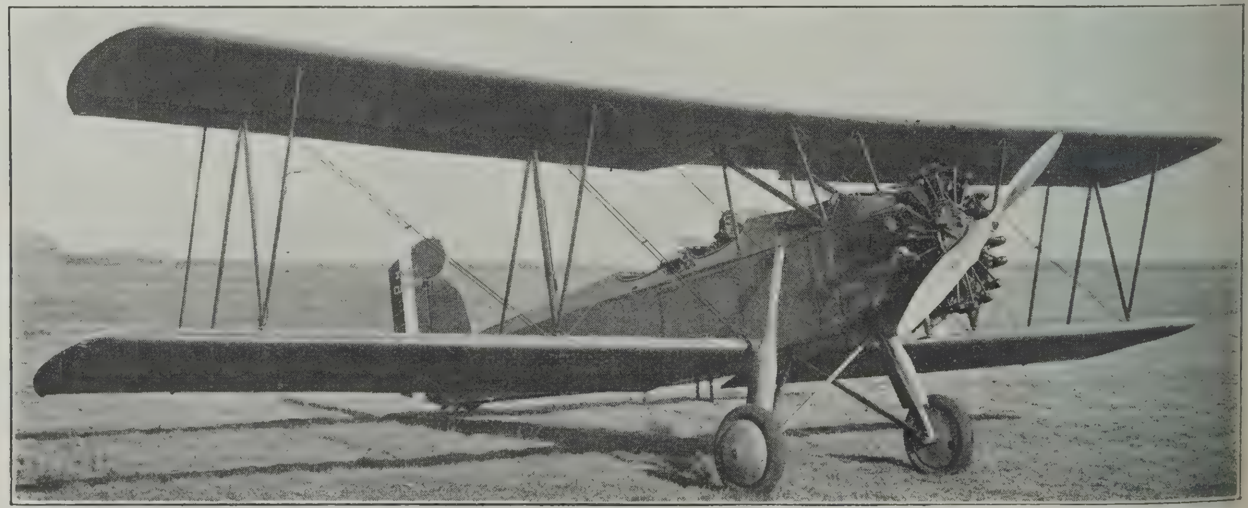
No information as to the charge to be levied for this course is available.

AVIA AIRCRAFT.

It is announced that the Aviation Department of the firm of Milos Bondy a Spol, of Prague, the producers of the well-known Avia aircraft, has been taken over by the Avia Akciova Spolecnost Pro Prumysl Letecky (the Avia Aeronautical Engineering Co. Ltd.). The address of the company, Osadni 799, Prague VII Czechoslovakia, remains as before.

The latest product of this company, the Avia B.H.33 single-seat fighter fitted with a 450 h.p. Walter-built Bristol Jupiter engine, has recently been submitted to the official tests of the Czechoslovakian Ministry of National Defence in the presence of a Finnish Military Mission. It passed these tests brilliantly, exceeding, by a considerable margin, the required performance of a machine of this class.

Since passing these tests it has been demonstrated before a Lithuanian Military Commission and in January it proceeded to Warsaw to be submitted to the Polish authorities.



THE CURTISS FLEDGLING.—A three-quarter front view of the new training biplane produced by the Curtiss Company for the U.S. Navy.

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LIGHT ALLOYS FOR AIRCRAFT WORK.

Few classes of material have raised such high hopes on the part of those who have originally produced them, and so many disappointments on the part of those who have sought to use them as some of the aluminium alloys of high tensile strength.

Most of these alloys have been produced originally in metallurgical laboratories, and as produced in those establishments have given remarkably useful qualities. Unfortunately when attemps have been made to produce them on a commercial scale it has often been pronounced impossible to secure the results claimed by the original investigators and producers, and it has been said that the necessary accuracy of composition, freedom from impurity, and careful control of the whole process of manufacture and heat treatment which can be applied in the laboratory and does secure the results claimed, cannot be reproduced commercially.

It is undoubtedly true that alloys of this type made to laboratory standards in such respects must necessarily be more costly than the ordinary commercial class of aluminium alloy. On the other hand for work where low weight and high and uniform physical qualities are all important there are markets for materials of this type prepared with the greatest possible care, even if the price is relatively high. One of these markets is undoubtedly the Aircraft Industry.

To supply this particular market, Mr. W. C. Devereux, recently Works Manager of Peter Hooker Ltd., has acquired from the liquidator of that firm the goodwill of the business in light alloys formerly carried on by them, and has formed a new company, known as High Duty Alloys Ltd.

High Duty Alloys Ltd. has built a works on the Slough Trading Co.'s Estate at Slough, which has been laid down with the object of making it possible to produce light alloys in commercial quantities with laboratory-like accuracy.

One of the chief features of these works is their scrupulous cleanliness. The foundry for example bears no resemblance whatever to one's preconceived ideas of foundries in general. It is light, clean and smokeless. The four furnaces are oil-fired, and the air is not even smoky. The floor is clean smooth cement, and it is kept clean. Thus it is practically impossible for undesired dirt to find its way into or even onto any batch of metal.

Exceedingly careful control is kept over the composition of all alloys made. High Duty Alloys Ltd. start from the raw metals—aluminium, copper, nickel, etc.—and analyse all these to ensure their purity. From the pure metal they make their own "hardeners"—that is alloys of aluminium rich in one or another of the alloying elements. Each melt of hardener is again analysed, marked with its melt number for identification, and put into its own bin in the stores.

To produce the final ingot of any desired alloy, the firm's metallurgist draws up a requisition on the stores for so many pounds of aluminium, so many pounds of such and such hardeners, specifying for each the bin from which each is to be drawn. Thus the precise quantity of each element put into the furnace is directly controlled by the metallurgist.

The melt being made, and ingots cast, a sample is taken and analysed, to ensure correctness of composition, and a specimen is polished and examined microscopically to see that its structure is satisfactory.

All furnaces are fitted with recording pyrometers, and the records are made in the metallurgical office, so that any deviation from correct temperature limits is firstly noticeable at once, and secondly is put permanently on record.

When the ingots come from their moulds, the tops are cut off, and the ingots are then turned to remove the outer skin and any imperfections or impurities contained therein, before heat treatment, forging, or any other work is done on them.

As a result of this very careful control throughout their works, the products are found to be exceedingly uniform and satisfactory in every way. Rejections of materials or finished parts for aircraft engines, for instance, for defective material are practically unknown in these works.

Those members of the Aircraft Industry who use aluminium alloys of the high tensile type will realise that this fact alone is well worth a high price for the original material.

At present the firm is confining its attention to the production of two alloys, both known under the trade name of "Hiduminium." One of these—the Y Brand—is the well-known "Y" alloy which in the forged state is guaranteed to develop from 22 to 27 tons per sq. in. ultimate strength. The other, the "DU" brand is to D.T.D. specification 18A and is guaranteed to develop between 25 to 30 tons per sq. in. ultimate tensile strength, with an elongation between 15 to 25%. It may be said in passing that the firm's records show that these guaranteed figures can easily be maintained, and that the material produced by them is as nearly perfect in its freedom from pinholes and other defects as can be desired by the most particular of A.I.D. inspectors.

PREVENTING WEAR AND CORROSION.

To the engineer the electro-deposition of metals means electro-plating as a means of giving cheaply an ornamental but usually temporary finish to articles of steel, brass or other common metals. Nickel-plating has been used largely by the cycle, motor-car, and other industries on components which need both a high finish and some protection against rusting or corrosion. Nickel itself is hard, wears well, and does not corrode easily, and therefore is an excellent metal for such purposes.

Nickel-plating however has not been very satisfactory even for this limited end. Nickel deposited straight on to steel or iron rarely remains in place for long. Rusting starts under the nickel and the nickel peels off. By first plating steel with copper and then with nickel better results can be attained, but even this double plating breaks down in time because corrosion occurs below the plating.

This failure of electro-plating is caused by the fact that there is no real junction between the plating and the original metal, and corrosion is often accelerated by impurities which are left between the base and the deposit in the plating process.

By developing a process which ensures that electrically-deposited metal shall penetrate into the structure of the original metal, giving a joint between the two metals which in many ways resembles a soldered joint, the electro-deposition of metals has been changed from an ornamental art to an engineering process of very great importance.

A New Art.

A process which does give this result has been developed by Fescol Ltd., of 101, Grosvenor Road, London, S.W.1 This process is the result of experimental work started before the War by Mr. Fletcher, Managing Director of the firm. The process was first exploited commercially by the Fletcher Electro Salvage Co. Ltd., and the word Fescol, formed from the initial letters of the original title, was used as a trademark. The company has since changed its style to Fescol Ltd.

That the result of the Fescol process is entirely different from that produced by ordinary electro-plating is shown by some tests made by the National Physical Laboratory. A nickel ring was deposited on a test-piece of mild steel. The nickel ring was threaded and screwed into a suitable holder and the specimen was pulled in a testing machine. The nickel ring was pulled off at a load of 17.6 tons per square inch on the adhesive area. But it was the steel under the nickel which sheared.

Originally the Fescol process was mainly used for salvaging worn or damaged parts of machinery by building them up with a nickel deposit, which accounts for the firm's first title. The process has since shown itself to have a much wider field of usefulness than that of mere salvage, though this still forms a very important part of the Fescol business, and affords some of the most striking examples of the qualities of a Fescol deposit.

Re-Conditioning Wearing Parts.

Many of the largest of the motor-transport organisations, including the London General Omnibus Company, regularly send worn and damaged 'bus or lorry components to be treated by the Fescol process. Steering pivot pins are built up with nickel, and machined to size. These salvaged pins are found to run between two and three times as long as new pins. New stub axles for 'buses after running 4,000 miles showed .009 inches wear. These axles after being nickel-coated had worn only .003 inches after 4,000 and only .008 inches after 15,000, miles. Worn crankshafts and pistons rebuilt up to full size equally show a less rate of wear than did the original components.

The process has been used successfully to build up seatings for journal ball-races on aero-engine crankshafts, slack bearing-housings in aero-engine crankcases, worn-out sparking plug threads in aero-engine cylinders, and so forth.

An even more striking example of the qualities of the Fescol deposit is that it is regularly used to build up damaged splines on the transmission of motor-'buses and lorries. Recently Fescol Ltd. have repaired in this way the splines on damaged airscrew hubs and shafts of Gnôme-Rhône Jupiter engines belonging to a well-known European air line. These repairs have proved entirely satisfactory.

Anti-Corrosion.

Although such salvaging and rebuilding work is a very important part of the Fescol business, the use of the process to give protection against corrosion or erosion is now becoming nearly as important.

It is now used regularly for protecting steam-turbine blades, valve spindles for Diesel engines, impellors for centrifugal pumps, and the like, against erosion by hot gases or superheated steam. It has been found possible to use iron or steel, Fescol protected, in place of much more expensive materials in chemical plants and machinery where steel or iron unprotected would be attacked immediately by acids or the like.

As an instance a steel plunger protected by Fescol was used to pump caustic soda and remained in good condition after having out-

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G. THARRATT.

lasted three plungers of Monel metal used for the same purpose. All previous efforts to use a steel plunger for this work had failed.

Of direct aeronautical interest is the fact that exhaust manifolds for high-powered radial air-cooled aero-engines welded up from ordinary mild steel and nickel-coated by Fescol Ltd. have shown themselves to have as long a life as similar manifolds made of special non-corrosive metal. And these Fescolised manifolds cost about two-thirds as much as those of non-corrosive material.

Fescol-protected manifolds are in use on a number of engines in the possession of the R.A.F., and an order to "Fescolise" fifty similar manifolds has recently been placed by a famous British firm of aero-engine builders.

WEIGHT-SAVING.

Another matter of aeronautical interest is that sheets of light alloy, nickel coated by Fescol, can be soldered and made up into petrol and oil tanks by precisely the same methods as are used for ordinary tinned steel tanks. Some experimental work in this direction has already been done, with very promising results. Tanks so made are roughly one-third the weight of tinned steel tanks.

Cylinders of water-cooled engines in motor-boats nickel-coated by the Fescol process before the water jackets are attached have been found to resist corrosion by the sea-water used for cooling. Fescol Ltd. are ready to produce complete cylinder jackets of nickel, deposited on the cylinder (as the old copper jackets used to be deposited on the E.N.V.), which should prove not only free from corrosion but should avoid many of the jacket failures which occur with welded-on sheet-steel jackets.

One regular product of Fescol is nickel-covered bolts and nuts. In these not only head and shank are nickelled but also the threads. These have proved a complete cure for rusted-on nuts on 'bus and lorry chassis, and a similar treatment of screwed parts on aircraft would be of great value. In seaplane work many fittings which otherwise have to be made of expensive non-corrodible steel very difficult to work, could be made of cheaper steel and nickel-coated.

OTHER THAN NICKEL.

So far one has referred only to what has been done by Fescol Ltd. with nickel. Nickel may be deposited on practically any metal which is used in engineering, including nickel itself, high-tensile heat-treated steel, and the light alloys, in all cases with the perfect adhesion and complete protection against corrosion which is the special feature of the Fescol process. And it will be fairly obvious that if the process stopped short at nickel it would have a very wide range of usefulness in aeronautical engineering.

But not only nickel but copper, chromium, cadmium, iron, cobalt, lead and zinc may be deposited with the same characteristic of perfect adhesion between the base and the deposited metal.

Of these various metals chromium seems likely to prove most interesting to the aeronautical engineer. Chromium is a good deal harder than any ordinary tool steel. You can cut glass with the edge of a chromium-plated brass tube. It is of a brilliant white colour—brighter than nickel when polished—and even less subject than that metal to corrosion.

A chromium coating cannot be scratched by anything much softer than a diamond, and therefore if used as a protective coating against rust or corrosion it is to all intents indestructible.

It is being used in the United States to face gauges, and to tip tools made of soft steel for machining the hardest materials. One great American motor-car works have found that chromium-plated gauges wear three times as long as bare steel gauges and when worn they can be renewed by replating at a very low cost.

CHROMIUM BEARINGS.

Although Fescol-deposited nickel has been found to wear better than the original steel of many motor-car components it is probable that nickel is not sufficiently hard to use as a wearing surface on some of the more heavily-loaded bearings of a modern aero-engine.

But there is not the slightest doubt as to the sufficient hardness of chromium for the purpose, and there is every likelihood that Fescol-deposited chromium may in the near future take the place of surface-hardening on gudgeon-pins, crank-pins and similar components of aero-engines.

This would not only mean a very great improvement in the wearing qualities of these parts, but it would also make for much greater reliability in the materials used for these parts. It is always difficult to make certain that the core of any part case-hardened by heat treatment is sound, and chromium plating would not only cut out this element of uncertainty, but would extend the range of steels which can be used for such parts.

To sum up the Fescol process seems to offer to the aeronautical engineer services in three entirely different branches of work. The first and most important possibly is that of giving a method of covering either steel or the light alloys with a layer of exceedingly hard and exceedingly uniform metal, either nickel or better still chromium, which will resist most corrosive agencies. This coating can be applied to finished working surfaces, such as screw-threads, and if necessary can be machined to the closest limits of dimension

The second is the provision of a surface finish for wearing parts both harder and more resistant to corrosion or erosion than can be obtained by ordinary methods on steel. With chromium surfaces better wearing qualities can probably be obtained than with any steel however treated. Even with nickel it should be possible to use ordinary mild steel where now a much more expensive material is necessary.

Lastly there is the possibility of renewing, comparatively cheaply, worn or damaged parts instead of replacing them. There are probably fewer openings of this class for the Fescol process in aeronautical engineering than there are in connection with the motor transport industry, but there are such openings. In this connection it may be recalled that attempts to renovate worn parts of aero-engines by electric-plating methods were made during the War. Slack housings for ball-races were so treated, but those early experiments were not always successful. There seems no room for doubting that repairs of this type could now be made with perfect confidence.

In fact it would seem that the need for any such repairs could be avoided by nickel facing such housings in the first place.

BY ERROR.

One of those unhappy errors that will occur caused THE AEROPLANE of Mar. 28, on page 422, to describe the camera fitted to Mr. Raynham's Avian as the Wilkinson Eagle Camera. The Camera is the Williamson Eagle Camera, made by the Williamson Manufacturing Co. Ltd., and sol by Vickers, Ltd., Vickers House, Broadway, Westminster, S.W.1.

A PRIVATE PILOT'S GUIDE.

"Pilot's 'A' Licence." Compiled by John F. Leeming. Published by Sir Isaac Pitman and Sons Ltd. Second Edition. Price 3s. 6d. net. Obtainable from THE AEROPLANE Book Department, 14, Bream's Buildings, London, E.C.4.

In this handy volume Mr. Leeming, out of the fullness of his experience as one of the Royal Aero Club's observers for the tests for pilots' certificates, has set out clearly what has to be done to obtain the Air Ministry "A" licence, which is required for private flying in this country.

The primary requirement for this licence is that the applicant shall have learned to fly, and this side of the business is in general looked after by the applicant's school or club instructors.

Over and above this, however, there are numerous formalities, medical and technical examinations to be passed, official forms to be filled in, and fees to be paid. Full and accurate information as to these matters will be found clearly and concisely expressed in this book.

In addition, all those sections of Air Navigation Regulations which the candidate is required to know and understand, and concerning which he may be examined, are transcribed in full.

In connection with this section occurs the only ground for criticism that has been found. In the extracts from the Regulations there are frequent references to preceding or following paragraphs giving the official paragraph numbers. Many of the numbers so referred to are not discoverable in the abstracted regulations as reproduced, and it is consequently impossible to look up these references.

The book can confidently be recommended to the would-be private pilot, not only as a guide to the acquisition of his licence, but also as a handy book of reference to the more important Air Navigation Regulations.

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SIR ALAN COBHAM'S PROGRESS.

Sir Alan Cobham, who, with Lady Cobham, Mr. Worrall and crew, are making a survey flight round the African coast on the Short Singapore flying-boat (two 650 h.p. Rolls-Royce Condor engines), left Cape Town on April 4 and flew to Lüderitz, South-West Africa.

On April 6 he flew to Walvis Bay, South-West Africa.

On April 7 he flew to Port Alexander, Portuguese West Africa.

On April 8 he flew to Lobito Bay, Portuguese West Africa.

On April 9 he flew to Banana Bay, at the mouth of the river Congo.

Mr. Green, of the Rolls-Royce Company, had been ill since leaving Cape Town, and he had to be put on board a ship for home at Banana Creek.

On April 10 he flew to Libreville, French Congo.

On April 11 he flew to Bonny, Nigeria.

On April 12 he flew to Lagos, where he stayed until April 15.

On April 15 he flew to Takoradi.

METAL AIRSCREWS ON THE FAR EAST FLIGHT.

It will be remembered that in the recently published log of the first stage of the Far East Flight from Plymouth to Karachi, it was mentioned that two of the Southampton flying-boats had trouble with their wooden airscrews.

On Nov. 4 S.1150 had to change both its wooden airscrews at Alexandretta as the brass on each blade began to draw the fastenings.

Again on Nov. 7 at Hinaidi, S.1149 had similar defects to those shown in S.1150, but as spares had not arrived temporary repairs were made which lasted to Basrah where two new airscrews were fitted.

It is now announced that the other two boats left Plymouth fitted with hollow steel detachable bladed airscrews manufactured by Metal Propellers Ltd., of Purley Way, Croydon, Surrey.

These airscrews have performed very satisfactorily throughout the voyage to Singapore, except that owing to the paint wearing off, the blades have had to be treated with Lanoline paint at intervals.

Except for this minor point, the performance has been so satisfactory that the other two machines have now been equipped with metal airscrews.

HAIL AND FAREWELL!

On Apr. 5, Mr. F. G. M. Sparks, Chief Instructor of the London Aeroplane Club, left England for Canada to take up the post of Chief Instructor to the Light Aeroplane Club which is being formed there under the patronage of the Canadian Government. Mr. Sparks desires, through the columns of THE AEROPLANE, to thank the many members of the London Aeroplane Club who subscribed to the Testimonial Fund for him, and to say how sorry he is in many ways to leave them.

In this matter, England's loss is very much Canada's gain. From that early day in Civil Aviation when he appeared at the Flying Meeting at Croydon with an ancient Renault-engined Avro of his own which he had faked up for the occasion, and not only scooped nearly all the prizes but thoroughly looted the bookmakers by backing himself, "Sparkey," as he was generally called, has been one of the leading characters of Civil Aviation.

As an instructor on light aeroplanes he has no superior in this country, which is to say in the World. As a racing pilot on light aeroplanes he is equally unsurpassed. What his machines have on occasion lacked in speed, he himself has made up in skill and wilyness, and the duels fought out between him and Mr. Parkinson of the Newcastle Club at so many meetings have done much to rouse the sporting spirit among the Light Aeroplane Clubs.

Apart from his skill as a pilot and an instructor, he will be especially missed at all Aviation Meetings, for in the past his passion for argument before, during and after the meeting, whether on aerodrome or in local hotel, has added materially to the joy of all within hearing.

On behalf of all concerned with Sporting Flying in this country, one wishes Mr. Sparks every good fortune in his new life and one congratulates Canada on having secured one of our best.—C. G. G.

THE AIR LEAGUE'S PARTY.

The Air League of the British Empire,—to the number of about 1 including guests,—held its first Annual Dinner at the Savoy April 3. Mr. Philip S. Foster was in the Chair.

Sir Eric Geddes, who said that he was speaking as the Chairm of Imperial Airways, said that he thought criticism of the A Ministry was very helpful. Sir Samuel Hoare must be made do more for Civil Aviation. Air passengers should pay for the ti saved as well as for the journey itself. The operating company the main trunk routes must have security of tenure with no co petition. Feeder lines to the main routes were required with Gover ment support and supervision. The Empire must be linked up a the Government must find the money. He added that the Gover ment must find the money to develop the light aeroplane for t swamps of Africa and the hills of the Himalayas.

Sq. Ldr. the Rt. Hon. F. E. Guest, proposing British Aviati said that Sir Eric Geddes had given those present the result of fo years' thought. Propaganda were of intense value. Pioneering the Service and civilian sides of aviation was unsurpassed but aviati at present was all pioneers and no foundation. He said that rapid co vertability of civil machines into military machines made the ci and military side interdependent. He could not understand why no of the 50 committees of the Committee of Imperial Defence had r recommended the transference of some of the money given to t other Services, to the R.A.F. More landing grounds were needed this country. He thought that Civil Aviation should be independe of the Air Ministry at all costs.

Colonel the Master of Sempill, replying for British Aviation, sa that Captain Guest was a former and undoubtedly a future Air Minist If the Aircraft Industry were not supported now it would not be al to support the Service in case of need. He thought the Short Serv commission system in the R.A.F. was deplorable. The bulk of the officers left the Service unfitted for any task open to them to-day a it was bad for the R.A.F. to have all these disgruntled people knocki about. The Engineering and Technical side of the R.A.F. was ve neglected. The Air Minister was like Sinbad, he was always goi out into the wilderness and coming back with wonderful tales. was very regrettable to find so much disagreement among themsel in aviation circles. It was a grave stigma on the Air League tl General Groves was working for nothing. Colonel Sempill ended speech with an appeal for funds to help the Air League.

Rear-Admiral M. F. Sueter, supporting the response, after giving few reminiscences of seventeen years ago, said that the Air Leag ought to get money from the older Services for Service and Ci Aviation. He wished the Editors of *The Aeroplane* and *Flight* wo not jeer when people suggested that Atlantic flights should be co trolled. These lives that had been lost shook the confidence of t public in aviation. This speaker also ended with an appeal for fu for the Air League.

Lieut.-Col. Mervyn O'Gorman, proposing the Guests, said he thou that the Air League could do valuable work in shaking up somnol bands of expert autocrats.

Colonel Woodcock, M.P., replying for the Guests, said that he one of the critics of the Air Estimates but in spite of that he full of admiration for the work of the Air Force. He did not thi that anyone in the House of Commons criticised the amount of mo voted for the R.A.F. The Secretary of State for Air had done gr work in building up the force and his keenness was only limited the amount of money he could get out of the Exchequer, and after the Chancellor of the Exchequer was only looking after the mo of the people who belonged to the Air League.

Mr. G. C. Ammon, M.P., supporting the response, said that the League was of general interest to all political parties. He thou the development of air services would break down the barriers time and distance.

Colonel W. A. Bishop, V.C., proposing the Chairman, said tl Great Britain was dangerously far behind other European countr in the development of its air routes. He described some of his periences in Germany during the last few months, experiences wh he has already described in interviews with various newspapers. pointed out that 127,000 people flew in Germany in 1927 but o between 15,000 and 20,000 people had flown on Imperial Airways duri that year.

Mr. Foster, in reply, spoke of the small membership of the League and said that in addition to more members the League ba needed a patron to give it a large sum of money.

In reply to repeated calls upon his name Brig.-General Groves sa that considering that the country was spending 100 million pounds year on the supposition that war might recur he thought more sho be spent on Air Defence.

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THE SPREAD OF AIRMINDEDNESS.—Some of the population of Jaffa watching a display of flying by Messrs. Vintcent and Newall, who are on their way to India with two D.H.9s. They left England just after Christmas and have made various halts on the way for giving passenger flights of long and short duration. Handbills distributed at Jaffa read somewhat ominously, " Flying. To-morrow, Saturday, March 17, will be your last chance to have a flight."

Lady Heath's Record
—first woman to fly from
Cape to Cairo

HELIOPOLIS EGYPT. 4 APR. 28

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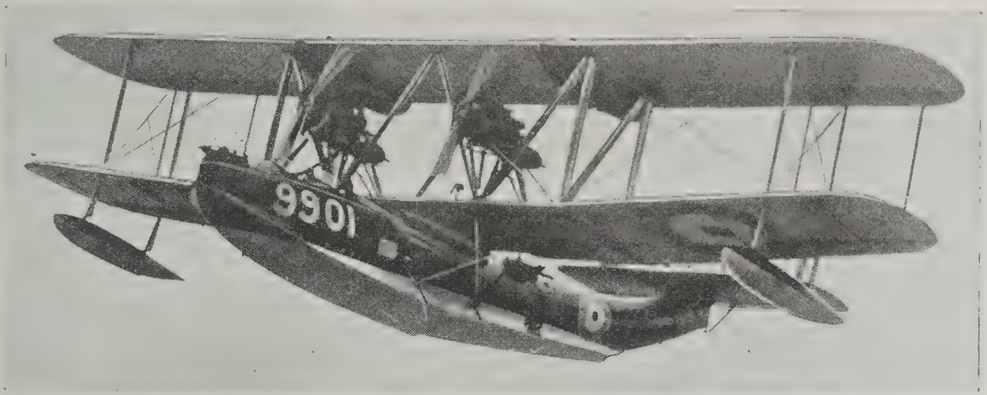

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LADY BAILEY'S PROGRESS.

The Times correspondent at Dar-es-Salaam, in a message dated April 13, states :—

Lady Bailey says, in explanation of her crash at Tabora, that when she was flying from Kisumu to Tabora she had no map of this stage. She flew to Nzega, but found that it was impossible to land. She turned back to Shinyanga, landed there to inquire as to the route, and then proceeded to Tabora. This delay caused her to reach Tabora at the hottest part of the day, when the air was bumpy, and the landing had to be made at an aerodrome 4,000 ft. above sea level. Lady Bailey considers that she took insufficient notice of the conditions, and struck an air pocket near the ground. Her machine made a heavy landing, and its undercarriage collapsed. The machine turned over, and came to rest upside-down. The fuselage and main wing spars were broken in places. It has now been dismantled, and the engine and tanks have been saved.

Although Lady Bailey thinks that the crash was due to her omission to remember the conditions prevailing at 2.30 p.m. at this altitude, she considers that this aerodrome could be made easier if a gap were cut in the line of trees bordering the west side, in order to facilitate approach from this direction, as it is at present somewhat difficult to get into the aerodrome during the heat of the day. Lady Bailey's impression of the country is that it is not as alarming an area to cross as she was led to suppose. She was impressed by the wonderful scenic contrasts from Nimula to Tabora, and considers them to be worth trips to view them when once a passenger air line has been established.

A further message states that Sir Abe Bailey is trying to procure an aeroplane in Johannesburg, and has been offered a machine belonging to the Johannesburg Light Aeroplane Club.

A *Reuter* message on Apr. 16 states :—

Major Meintjes, of the South African Air Force, has left Pretoria for Tabora flying a Moth aeroplane, which he will hand over to Lady Bailey (who crashed at Tabora on Tuesday), so that she may complete her flight to Cape Town.

LADY HEATH'S PROGRESS.

Lady Heath, who left Johannesburg on Feb. 24 on an attempt to fly to England, arrived at Cairo on April 3, where she was delayed until April 15 by the R.A.F. authorities, who considered that she should not undertake the Mediterranean section alone.

A message from *The Times* correspondent at Cairo dated April 13 states :—

Lady Heath states that as it was not possible to obtain an escort from the British authorities for the North African-Mediterranean section of her flight from the Cape to England, she had appealed to Signor Mussolini, who had replied forthwith by sending a machine for this purpose. Lady Heath will, however, await the arrival here of Flt. Lt. Bentley and his wife [who are also flying to England], as they have expressed the wish that she should avail herself of their escort.

A further message from the same source dated April 15 states :—

Lady Heath flew from Cairo to Sollum this morning. She did not wait for Flt. Lt. and Mrs. Bentley, who landed at Heliopolis this afternoon. She is proceeding to-morrow to Benghazi, and on the following day to Tripoli, where she will meet the Italian seaplane which Signor Mussolini has sent to escort her to Italy.

EASTER TOURS BY MOTH.

On Apr. 4 Major H. A. Petre left Stag Lane on his own Moth to fly to Biarritz for the holidays. Flying by way of Lympne for Customs clearance, he reached Tours by lunch time. He landed short of Tours out of petrol and by the time he had borrowed a push bicycle from a local farmer to go into Tours for petrol and lunch it was too late to proceed to Biarritz. On Apr. 6 he reached Biarritz where he stayed until Apr. 10, when he returned to Stag Lane completing the journey in one day with stops at Tours, St. Inglevert and Lympne.

On Apr. 6 Mr. Kittel left Stag Lane on his new Moth, and flew to Cologne, Hamburg, Copenhagen, Hamburg, Rotterdam, and returned to Stag Lane on Apr. 9. He spent the whole of the time in his machine, even to the extent of eating his meals in any field in which he may have landed.

Over the Easter Holidays the Duchess of Bedford flew to Frankfurt and back on her private Moth piloted by Mr. C. D. Barnard.

On Apr. 5 Mr. Downes-Shaw accompanied by Mr. Jopp, both members of the Bristol and Wessex Aeroplane Club, left Bristol on a D.H. Moth, and flew by way of Lympne, St. Inglevert, Paris, Avalon, Chalons, Lyons, Avignon, to Marseilles. They are due back to Bristol on April 15.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec. : H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending Apr. 8.

Flying Time 46 hr. 40 min. *Instruction* 29 hr. 10 min. *Soloists* 17 hr. 30 min.

Report for week ending Apr. 15.

Flying Time 21 hr. 45 min. *Instruction* 15 hr. 50 min. *Soloists* 5 hr. 55 min. *Instruction.—With Mr. F. G. M. Sparks*— Miss O'Brien, Miss W. Spooner. *With Mr. S. L. F. St. Barbe*—Mrs. Guest, Miss Johnson, Miss Wilson, Messrs. W. R. Presland, L. W. Gibbens, S. Hansel, J. A. Crane, E. Davis, L. C. V. K. Watson, W. F. Cole, L. Rowson, J. A. Murphy, R Ward, G. Black, J. G. Maitland-Edwards, A. O. Wigzell, A. E. Mines, G. A. Stedall, D. Green, F. C. Fisher, B. L. Middleton, Dr. Cook, Lord Carlow. *With Mr. F. R. Matthews*—Miss Wilson, Miss Cholmondeley, Mrs. Cook, Miss Fletcher, Mrs. Guest, Messrs. A. Mason, H. Sutton, E. R. Andrews, S. Hansel, P. A. Wills, W. F. Cole, L. F. Brown, G. C. Gotheridge, G. A. Stedall, A. O. Wigzell, H. B. Michelmore, W. H. Lane, H. Beamish, R. M. Edwards, A. Brunner, J. A. Murphy, R. Richmond-Brown, J. A. Crane, A. E. Mines, A. J. Richardson, B. L. Middelton, D. Green, F. C. Fisher, Dr. Cook. *Soloists.*—Messrs. C. E. Murrell, R. Sanders Clark, G. W. Hall, E. C. T. Edwards, J. J. Hofer, Will Hay, E. R. Andrews, G. H. Craig, W. L. M. O'Connor, B. B. Tucker, H. B. Michelmore, L. C. Davey, J. H. Saffery, N. J. Hulbert, H. Solomon, E. E. Fresson, E. L. D. Moore, M. L. Bramson, Major K. M. Beaumont.

Flying Return for the month of March.

Total Flying Time, 114 hr. 40 min. *Dual Instruction*, 142 flights, 63 hr. 30 min. *Soloists*, 158 flights, 45 hr. 20 min. *Passenger Flights*, 18 flights, 5 hr. 50 min.

Mr. S. L. F. St. Barbe has been appointed Chief Pilot Instructor in place of Mr. F. G. M. Sparks, who left for Montreal on Apr. 5 to take up his appointment of Chief Pilot Instructor to the Montreal Aero Club.

Mr. F. R. Matthews has been appointed Pilot Instructor to the Club. Mr. Matthews has for some years been on the instructing staff of the De Havilland Aircraft Co., and they kindly released him to the Club.

The Club is now arranging with the De Havilland Aircraft Co. for further accommodation. This includes a larger shed for the Club machines, lock-ups for the machines privately-owned by the Members, and Club Rooms.

Bristol Air Pageant.—The London Aeroplane Club will send a D.H. Moth to take part in the Bristol Air Pageant on May 5. Mr. Will Hay will represent the Club in the Inter-Club Race and Mr. S. L. F. St. Barbe in the Open Handicap.

The Lancashire Aero Club.

[Sec. : Woodford Aerodrome, near Stockport.]

Report for week ending April 7.

Flying Time 17 hr. 50 min. *Instruction* 10 hr. 10 min. *Soloists* 5 hr. 20 min. *Passenger Flights* 1 hr. 50 min. *Tests* 30 min. *Instruction.—With Mr. Baker*—Messrs. Benson, Tweedale, Weale, Johnson, Ellis, Stross, Faulkner, Goss, Mills, Gort, Hall, Greenhalgh, Allott, Birley, Mason, Hartley, Harrison, Miss Hill. *With Mr. Cantrill*—Miss Baerlein, Messrs. Johnson, Davison, Mills. *With Mr. Scholes*—Messrs. Benson, Harrison, Fallon, Gort. *Soloists (under instruction).*—Messrs. Cohen, Tweedale, Weale, Brooking, Gort, Hartley, Gerrard, Hall. *Pilots.*—Messrs. Heath, Goodfellow, Meads, Twemlow, Gattrill, Davison, Cantrill, Michelson, Williams and Lacayo.

Nine passengers were given joy-rides.

Excellent first solos were made by Messrs. Hartley and Weale. We were glad to receive a visit last Sunday from Mr. Bellhouse, one of our vice-presidents, who shows a very keen and appreciative interest in the work of the Club.

The Newcastle-upon-Tyne Aero Club.

[Sec. : A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending April 15.

Flying Time 13 hr. 50 min. *Instruction* 1 hr. 45 min. *Soloists* 45 min. *"A" Pilots* 7 hr. 35 min. *Tests* 50 min. *Passengers* 2 hr. 55 min. *Instruction.—With Mr. J. D. Parkinson*—Miss Slade, Mr. L. M. Middleton, Mr. W. Todd, Mr. J. M. Campbell, Mr. F. W. Redshaw. *"A" Pilots.*—Mrs. Heslop, Miss Leathart, Mr. Baxter Ellis, Mr. D. Wilson, Mr. A. Bell, Dr. H. B. L. Dixon, Mr. C. Thompson, Mr. F. L. Turnbull, Mr. J. D. Irving, Mr. P. F. Heppell. *Soloists.*—Mr. Lloyd Browne, Mr. G. E. Brooks *Number of passengers.*—11.

With the exception of Monday and Sunday, flying was hardly possible at all on account of fog, wind and snow; even on Monday and Sunday "snappy" winds prevented many members from flying.

The Yorkshire Aeroplane Club.

[Sec. : Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, Yorks.]

Report for fortnight ending Apr. 14.

Flying Time 39 hr. 30 min. *Instruction* 21 hr. 10 min. *Soloists* 16 hr. 5 min. *Passengers* 2 hr. 15 min. *Instruction.—With Mr. Beck.*—20. *Soloists.*—8. *"A" Pilots.*—9. *Passengers.—With Mr. Beck*—3. *With Mr. I. Thomson*—1. *With Mr. Wood*—3.

The Midland Aero Club.

[Sec. : Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending Mar. 31

Flying Time 24 hr. *Instruction.—With Flt. Lt. Rose*—Messrs. E. P. Lane, H. D. Coleman, S. Duckitt, G. Aldridge, J. R. H. Baker, H. Beamish, H. Tipper, S. G. Hall, W. M. Morris, H. Tower. *Secondary Dual.*—Messrs. A. B. Gibbons, J. Rowley, A. Ellison. *Soloists.*—Messrs. A. B. Gibbons, J. Rowley, G. Robson, E. J. Brighton, E. D. Wynn, H. J. Willis, E. R. King, R. L. Jackson, S. H. Smith, A. Ellison, W. Swann, C. W. Fellows, R. D. Bednell. *Number of Passenger Flights.*—5. *Flying Time for March.*—72 hr. 45 min.

On Monday Mr. Norman Jones called in for petrol and on Friday Miss O'Brien arrived and left the following day.

Report for week ending Apr. 7.

Flying Time 19 hr. 11 min. *Instruction.—With Flt. Lt. Rose*—Messrs. E. P. Lane, H. Tipper, J. R. H. Baker, J. B. Biggs, G. Aldridge, R. L. Brinton, S. Duckitt, G. E. C. Hill, W. M. Morris, S. G. Hall, Capt. H. G. Tower. *Soloists.*—Messrs. G. Aldridge, S. H. Smith, R. L. Jackson, R. D. Bednell, E. J. Brighton, R. L. Brinton, J. R. H. Baker, A. M. Glover, E. D. Wynn, A. B. Gibbons, A. Ellison., *Number of Passengers carried.*—4.

Report for week ending Apr. 14.

Flying Time 7 hr. 42 min. *Instruction.—With Flt. Lt. Rose*—Messrs. W. M. Morris, J. R. H. Baker, S. G. Hall, S. Duckitt. *Soloists.*—Messrs. E. J. Brighton, J. R. H. Baker, E. R. King, S. H. Smith, C. W. Fellows, R. L. Jackson, G. V. Perry. *Number of Passenger Flights.*—4.

Very high winds have seriously interfered with flying throughout the week.

On Sunday Messrs. Aldridge and Baker were launched solo and both put up a satisfactory performance.

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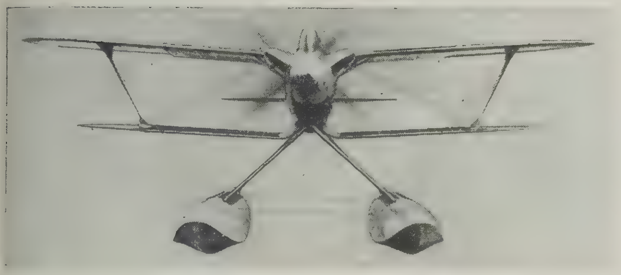

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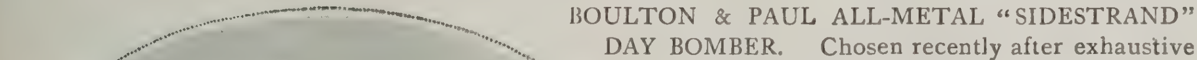

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The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending Apr. 8.

Flying Time 30 hr. 10 min. *Instruction* 13 hr. 25 min. *"A" Pilots* 6 hr. 30 min. *Soloists* 3 hr. 35 min. *Passenger Flights* 5 hr. 15 min. *Tests* 1 hr. 25 min. *Instruction.—With Flt. Lt. F. A. Swoffer.*—23. *"A" Pilots.*—8. *Soloists.*—9. *Passengers.—With Flt. Lt. Swoffer*—10. *With Mr. Forbes*—1. *With Mr. Kirby*—2.

Mr. Powell and Mr. Collier made a successful first solo during this week.

The total flying time for March, 105 hr. 15 min., is a record for any month in the history of the Club.

The Hampshire Air Pageant.

The second Hampshire Air Pageant, organised by the Hampshire Aeroplane Club, will take place on Whit Sunday and Monday, May 27 and 28, at the Hamble Aerodrome, near Southampton. It is the second of four provincial Air Meetings officially sanctioned by the Air Council to be held during the year, the others being at Bristol, Birmingham and Blackpool.

Last year the Hampshire Air Pageant was one of the most successful provincial flying meetings held, and attracted approximately 50,000 people. This year an even larger and better aerial display is promised and there will be considerable improvement in the general organisation of the meeting, which last year left something to be desired owing to the unexpectedly large invasion of the aerodrome by the public from all parts.

The Pageant last year was organised on the basis of a gathering of 25,000 people. Almost double this number converged on the aerodrome. Profiting therefore, by their experience, the organisers have this year taken steps to prevent any repetition of the congestion and delay experienced in getting to and from the aerodrome, and the Hampshire County Police are making special plans to organise the vast road traffic expected, and to facilitate its progress along specially chosen routes. Other improvements in ground organisation are also contemplated so as to prevent, as far as possible, all cause for complaint.

The Southern Railway have decided to provide special facilities and cheap tickets and they will run special trains to the aerodrome from London and large provincial centres. Motor-coaches will run to Hamble from all adjacent parts of Southern England at special fares.

A particularly attractive programme of competitive and spectacular events has been arranged.

The R.A.F. will again co-operate by sending to the Pageant various types of Service aircraft. Various evolutions in the air, exhibitions of formation flying and aerobatics will be made by Service and civilian aircraft.

Imperial Airways Ltd. are sending an air liner, as used on the Cross-Channel air services, in which pleasure flights will be available to the public both on Whit Sunday and Monday.

Whit Sunday will be "Members Day" and on this day the various competing aircraft will assemble at the aerodrome. If there is a large number of entries for any of the races, heats will be flown on the Sunday, and the finals on the following day. Many well-known pilots have already notified their intention of entering for certain of the competitive events.

Handicap races for all types of aircraft will be included in the programme. The chief event of the meeting is the Morris Open Handicap, for the Morris Challenge Cup, presented by Mr. W. R. Morris, of motor-car fame. This is open to all-comers, and it is expected that some really fast military aircraft will be entered by aircraft constructors. The holder of the trophy is Mr. B. Youell, who won the race last year on an S.E.5a.

The President's Cup Race is open to any members of a British Aero Club piloting any aircraft having an engine not exceeding 100 h.p. This Cup has been presented by Lord Louis Mountbatten, President of the Hampshire Aeroplane Club.

The Wakefield Challenge Cup has been presented by Sir Charles Wakefield, Bart., for a race open to any light aeroplane. The winner last year was Mr. L. J. C. Mitchell, piloting a Bristol Brownie, entered by the London Aeroplane Club.

A further event open to competition between representatives of the various subsidised aeroplane clubs in the country is the Light Aeroplane Utility Race for the S.B.A.C. Challenge Cup. Each competitor, with the aid of his passenger, will start up his engine, fly round the course with his passenger, fold wings and house the machine. In addition to the Challenge Cup, which may be won outright by three successive wins, there will be handsome cash prizes for the First and Second places in all competitive events.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending Apr. 15.

Flying Time 22 hr. 45 min. *Instruction.—With Mr. Fry*—Messrs. A. Woods, A. Archibald, H. Birchall, G. Watson Parker, N. Lindley, H. Neave. *Soloists.*—Messrs. F. Gough, W. A. Ramsay, R. W. Moore, W. P. Cubitt, R. T. Harmer, N. Brett, H. Mack, H. Pank, R. Potter.

We regret to announce that about 5.55 p.m. on Sunday our Moth G-EBQX was turning to land when it struck some power wires close to the aerodrome and crashed. The pilot, Mr. F. C. J. Fry, and pupil, Mr. H. Birchall, were slightly injured. The machine was rather badly damaged.

A prominent Norwich manufacturer, Mr. Henry N. Holmes, has presented the Club with £100 to show his confidence in aviation. Mr. Holmes it will be recalled was the co-donor with Mr. James Hardy of the Moth when the Club started operations.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending Apr. 14.

Flying Time 12 hr. *Instruction* 6 hr. 15 min. *Soloists* 3 hr. 50 min. *Passengers* 1 hr. 55 min. *Instruction.—With Mr. Bartlett*—Miss Huggett, Dr. Lysaght, Messrs. Hall, Garnett, Kennan, Girdlestone, Stevenson, Newman. *Solcists.*—Messrs. Arnold and Stevenson. *"A" Pilots.*—Messrs. Hall and Bathurst. *Passenger Flights.—With Mr. Bartlett*—5. *With Mr. Hall*—2.

Mr. Downes-Shaw accompanied by Mr. Jopp left this aerodrome on Apr. 5 and flew by Croydon and Lympne to St. Inglevert in 2 hr. 41 min. Thence they flew by way of Paris-Avallon-Chalons-Lyons-Avignon to Marseilles. They are now returning to Filton and are expected on Apr. 15.

The Cinque Ports Flying Club.

[Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

The Committee and members of Cinque Ports Flying Club wish to express their gratitude to the many thousands of people who gave their Inaugural Meeting such splendid support on Good Friday and Easter Saturday. The meeting was an unqualified success from the point of view of the Club, and also, it is hoped, of the public.

However, the Committee feels that an apology is due to all those people who were unable to secure a ride in one of the machines or who waited so patiently for such a long time in order to get a flight. The delay was due to the fact that some of the owner-pilots of the light aeroplanes present were not qualified to take passengers for reward and some had only recently learned to fly. The Club had no intention of subjecting passengers to the slightest risk and it was for that reason that several of the machines were idle. Also the attendance and demand for flights was quite outside anything that had been hoped for and the crowd was somewhat overwhelming as the Club was working with the assistance of only about a dozen voluntary helpers. However, it succeeded in carrying 525 passengers during the two days of the meeting, which must have convinced everyone of the extraordinary efficiency and utility of the modern light aeroplane.

The Club is still urgently in need of funds, and there are about 1,000 £1 shares still for disposal.

However, the Company is proceeding to allotment immediately, and an order has been placed for a De Havilland Moth fitted with Handley Page slots.

Members can be enrolled to begin flying within the next month.

All inquiries either for shares or for terms of membership should be addressed to the Hon. Sec., C.P.F.C., Ltd., 114, High Street, Hythe, Kent. Each shareholder will obtain free admission to all future meetings.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending Apr. 8.

Flying Time 91 hr. 40 min. *Instruction.—Dual,* 35 hr. 30 min.; *Soloists,* 51 hr. 15 min. *Other Flying,* 4 hr. 55 min.

Flying at the school was greatly curtailed owing to the Easter holiday. Nevertheless three Royal Air Force Reserve pupils successfully made first solos, and one civil pupil obtained his "A" licence.

Five new Moths were tested and various demonstrations given with the slotted wings Moth.

During the Easter holidays three machines represented us both at the Cinque Ports Flying Meeting at Lympne, and at the Suffolk Aero Club Meeting at Hadleigh. At both places Moth machines were very conspicuous, not only for their various successes, but also for their numbers, as at least twelve Moth private owners enthusiastically supported each meeting.

With the mention of "private owner enthusiasts" it is interesting to mention that recent pupil of ours, Lt.-Cdr. H. C. Macdonald, who only obtained his "A" Licence a fortnight ago, is now engaged in flying his Moth machine to India. At the time of writing he is to be congratulated on reaching Aboukir in a minimum of time.

Report for week ending Apr. 15.

Flying Time 131 hr. 55 min. *Instruction.—Dual,* 36 hr. 30 min.; *Soloists,* 68 hr. 50 min. *Other Flying,* 26 hr. 35 min.

In spite of some fairly rough weather, we have completed a reasonably good week's work and several pupils are now flying solo quite efficiently.

One R.A.F. Reserve pupil made a first solo, and another obtained his "A" licence.

Nine new Moths were tested during the week.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending Apr. 12.

Flying Time 44 hr. 30 min. *Dual.—With Messrs. H. D. Davis and A. E. Golds*—Messrs. Hsiao, Mitchell, Hamilton, Worley, Murray-Philipson, Hughes, Payne, Mills, Jonassen, Col. Rice, Dr. Forcyth, Flt. Lt. Halliwell. *Soloists.*—Messrs. Liniker, Crabtree, Anderson, Flt. Lt. Halliwell.

Owing to the Easter holidays and the Lympne Meeting the School has been slightly interferred with. The machines are now back and flying is proceeding as usual.

After a very successful tour in South Africa, Col. G. L. P. Henderson, M.C., A.F.C., has embarked for England and is due to arrive at the end of the month

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House of Commons, Mar. 12 '28

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 3; Monday, 19; Tuesday, 23; Wednesday, 22, Thursday, 20; Friday, 23; Saturday, 14

IMPERIAL AIRWAYS LTD. :
London — Paris — Zurich; London — Ostend — Brussels -- Cologne: Machines 54, passengers 471, freight 15 tons.

AIR UNION :
Paris—London: Machines 32, passengers 164, freight 12½ tons

K.L.M. :
Amsterdam—Rotterdam—London: Machines 16, passengers 92, freight 4 tons.

SABENA :
Brussels—London: Machines 11, passengers 14, freight 1½ tons.

DEUTSCHE LUFTHANSA AG. :
Amsterdam—London: Machines 14, passengers 75.

PRIVATE :
Machines 2, passengers 1.

Total number of trips by British Machines, 59, carrying 468 passengers. Foreign Machines, 75, carrying 345 passengers

COMPARATIVE FIGURES.

Week ending Apr. 14:
Machines, 129; Passengers, 817; Crews, 255; Total personnel, 1,072

Corresponding week, 1927:
Machines, 89; Passengers, 516; Crews, 150; Total personnel, 666.

Corresponding week, 1926:
Machines, 89; Passengers, 461; Crews, 116; Total personnel, 577.

Corresponding week, 1925:
Machines, 102; Passengers, 419; Crews, 131; Total personnel, 550.

Corresponding week, 1924:
Machines, 39; Passengers, 163; Crews, 59; Total personnel, 222.

Corresponding week, 1923:
Machines, 96; Passengers, 366; Crews, 156; Total personnel, 522.

Corresponding week, 1922:
Machines, 75; Passengers, 211; Crews, 128; Total personnel, 339.

Corresponding week, 1921:
Machines, 53; Passengers, 179; Crews, 69; Total personnel, 248.

Corresponding week, 1920:
Machines, 36; Passengers, 32; Crews, 36; Total personnel, 68

Croydon Notes.

Croydon is getting so busy nowadays that there seems unusually little except that busyness to put on record, a sign that things are working smoothly. If the traffic figures for the past few weeks are compared to those of weeks in the middle of last summer it may seem that traffic is still relatively light, for neither the number of trips, of passengers, or the weight of freight at present are up to the records of last June and July.

But there are about four hours less flying time to the day just now than in midsummer, and if this is taken into account it will be found that traffic just now is just as dense, if not denser, than it ever has been before.

There seems to be very little doubt that the new buildings are producing a distinct moral effect on passengers generally. There is an air of solidity and permanence about them that necessarily inspires more confidence in air transport as a serious business than was conveyed by the ramshackle collection of wooden huts at Plough Lane, and the air of respectable stability given to the business by these buildings undoubtedly promotes confidence on the part of would-be travellers.

The least satisfactory feature of traffic remains the large daily and weekly irregularity. During the past week the effect of travellers returning after the Easter holidays has been very marked. On Tuesday Imperial Airways and Air Union had to run a total of nineteen trips between London and Paris. These trips altogether carried 147 passengers, of whom 123 came to London from Paris, and only 24 travelled in the reverse direction. To a less marked extent this preponderance of incoming passengers was noticeab right up to the end of the week—which means that outwa machines had to be run with practically no load to deal wi the traffic the reverse way.

This is a special weakness of the Paris route, for London Paris traffic is so largely a pleasure traffic, and one sing larly seasonal in its density.

An interesting privately-owned light aeroplane, at prese housed by A.D.C. Aircraft, is a single-seater Westla Widgeon, belonging to Wing Cdr. E. R. Manning, D.S. M.C. This machine is fitted with special long-range tank and is to be used for a long-distance flight in the near futu

INCREASING AIR-MINDEDNESS.

During the Easter holidays the Cornwall Aviation Co pany carried 2,000 passengers in four days at Woolwic Three Avros were in use, piloted by Messrs. Philli Cameron, and Summerfield. Since Easter still more passe gers have been carried, including the Mayor and the To Clerk of Woolwich, who expressed great pleasure at bei able to see their borough from the air.

On Wednesday passengers were able to enjoy a ma vellous view of the surroundings in the clear air, and peo on the high ground round London several miles away we able to see the Cornwall Avros popping up and down alm continuously until dusk.

CIRRUS ENGINES.

The following cable has been received by A.D.C. Aircra Ltd. from Lady Heath, who has flown in an Avro Avi (Cirrus engine) from South Africa to Egypt :—

A.D.C. Aircraft Ltd.

During seventy hours touring South Africa and carrying first lig aeroplane from Cape to Cairo time honoured route the magnifice Cirrus in my Avian never missed a beat or dropped a revoluti although in Southern Rhodesia experienced tropical deluge and Sudan thermometer showed hundred twenty Farenheit.—Heath.

The Hon. Lady Bailey, who flew from London to Tabora a De Havilland Moth, was also equipped with a Cirrus engin

BRITISH AERO ENGINES IN ITALY.

Armstrong-Siddeley Motors Ltd. are exhibiting the Lyn Mongoose and Genet engines at the Milan Trade Fair.

PERSONAL NOTICES.

MARRIAGES.

BLAKE—COTTLE.—On Apr. 11, at St. Peter's, Frimley, Flt. Edward Arthur Blake, R.A.F., Sealand, to Dorothy Ella, daughter Mrs. H. B. Cottle, of South Kensington.

ELLIOTT—LOE.—On Apr. 11, Flt. Lt. Arthur John Elliott, R.A. to Molly Louise, elder daughter of Mr. and Mrs. W. E. Loe, Farnha

PENNY—CHADWICK.—On Apr. 10, Maj. Rupert Ernest Penn O.B.E., of the Air Ministry (late R.A.F.), second son of the late M Edmund Penny, C.I.E., and of Mrs. Penny, 1A, Wetherby Terra S.W.5, to Thelma, second daughter of Mr. James Chadwick, of Ne York, and Mrs. Chadwick, of Sundridge Park Mansions, Bromley.

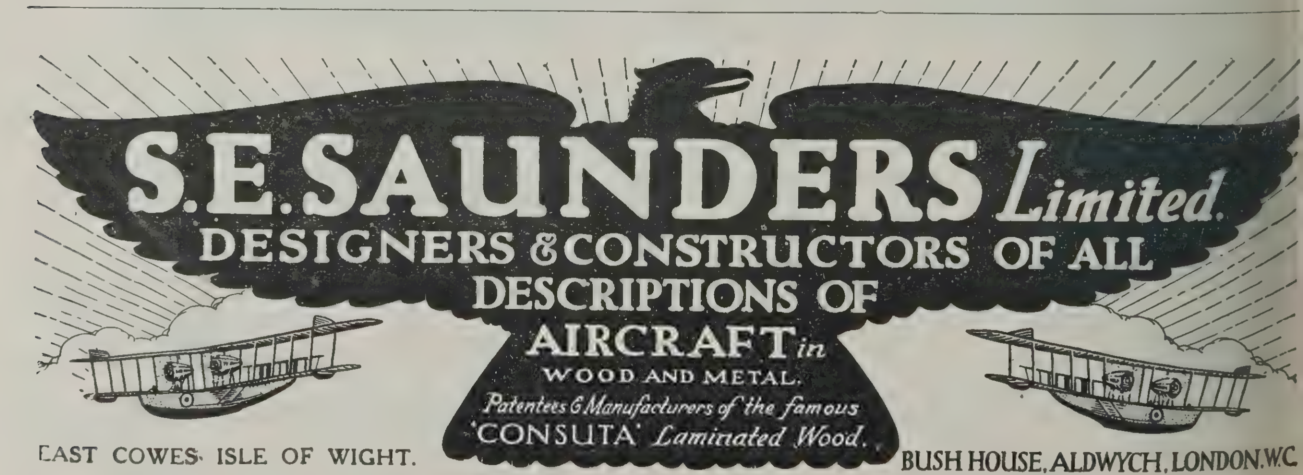
WOODHOUSE—WILKES.—On Mar. 24, at Datchet, Sq. Ldr. Jo Whitaker Woodhouse, D.S.O., M.C., R.A.F., son of the Rev. J. and Mrs. Woodhouse, of Dorking, and Kathleen Eleanor Wilke daughter of Mr. David Wilkes, of Forest Hill.

FORTHCOMING MARRIAGE.

MEAGER—BREWER.—The marriage between Capt. George Franc Meager, A.F.C., and Miss Betty Romilly Brewer, only daughter of M and Mrs. Griffith Brewer, of Little Burvale, Walton-on-Thames, wi take place at the Brompton Oratory at two o'clock on Apr. 28.

BIRTH.

CLEMSON.—On Mar. 28, at 106, High Street, Rochester, to Eilee wife of Flt. Lt. A. W. Clemson, O.B.E., D.S.C., R.A.F.R.O.—a daughte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THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C.G.Grey

Vol. XXXIV. No. 17. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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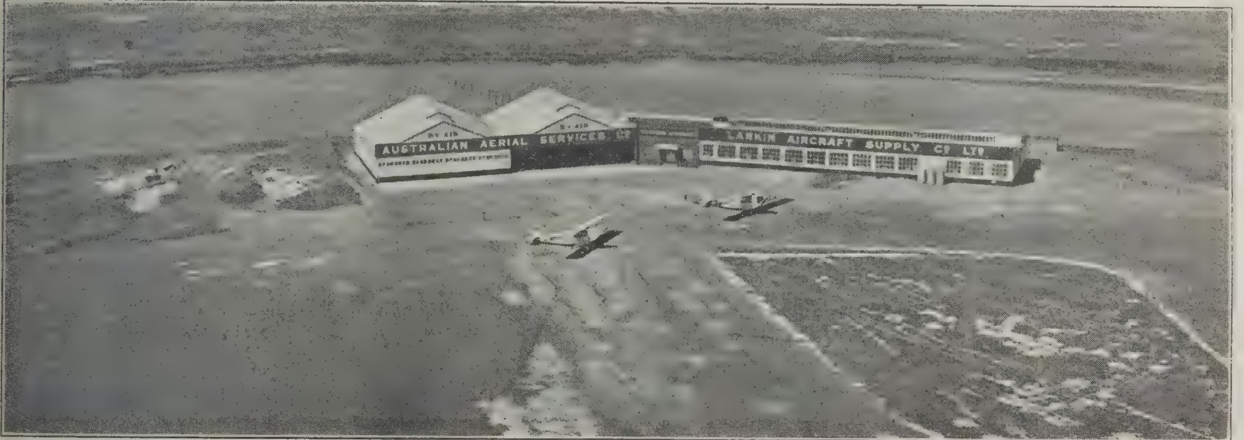

AN AUSTRALIAN HEADQUARTERS:—An aerial view of the works, sheds and portion of the aerodrome of the Larkin Aircraft Supply Co. Ltd. at Coode Island, near Melbourne. These premises were officially opened on Oct. 20, 1927, by H.E. Lord Stonehaven, Governor-General of Australia.

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APR. 25,
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THE AEROPLANE

VOL. XXXIV
No. 17.

Incorporating
Aeronautical Engineering

The Editorial Offices of "The Aeroplane" are at 175. Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings. E.C.4.
Telephone: Holborn 04.6.
Subscription Rates, post free: Home 3 months, 7s 6d.; 6 months, 15s.; 12 months 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months. 35s. Canada, 1 Year, 8$.
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ON AFGHANISTAN.

To the majority of the people of England, whether onlookers at the pomp and circumstance of a royal progress, or as readers of newspapers, the recent visit of the King and Queen of Afghanistan to this country has perhaps seemed only another of those interesting visits from foreign potentates which are apparently staged for the entertainment of the Great British Public. To those with a keener sense of History in the Making this visit has been one of the most important events since the end of the War 1914-18.

Afghanistan is but a small kingdom, but in the next war it may well be to India what Belgium was to France n 1914. In those early days of the War a cartoon in *Punch* showed a small Belgian boy barring the progress of a German soldier with the words "I am a kingdom, not a road." Just so in the future the Afghans may well be asked to decide whether their territory shall be a road into India for the Russian Armies or whether it shall definitely bar their progress.

On that decision will depend whether our Air Force will have to work from the Indian side of the Khyber, or whether we shall be asked to throw strong forces into Afghanistan to defend that country against a Russian advance from the direction of Turkestan. And as the Russo-Afghan frontier is bordered by strategic railways coming from the Caspian and from Moscow, there would be distinct advantages in working from aerodromes in Afghanistan.

Which side Afghanistan takes must depend entirely on who happens to be the ruler at the moment. The population of the country can have but little to say on the subect. To a certain extent that is true of any country, but n a country the people of which are fairly well educated and politically organised, as are the peoples of Western Europe, public opinion does count for something sooner r later, whereas in a country such as Afghanistan where he people are entirely uneducated, the political action of he Nation as a whole must depend primarily on the Governnent.

GOVERNMENTS AND PEOPLES.

Very often Governments make unfortunate mistakes. For xample, in 1914, as one said quite clearly in THE AEROLANE on the day War was declared, we found ourselves, hanks to our *entente cordiale* with France, allied with our atural enemies the Russians. And, of course, the Russians et us down.

But, at any rate, there was never any love between the Russians and the English as individuals, in spite of our political alliance. And for quite a long time, until things rew so bad that the authorities had to take action, the most effective spies for Germany in this country were Russians who were received in London Society, picked up odds and ends of Service secrets at dinners and parties, and onveyed them to Germany by way of Holland, Switzerland and Scandinavia.

To-day, thanks to Bolshevism in Russia, all Russians are uspect in this country, whether of the obviously squareeaded Russian (or Ashkenazim) Jew type or of the longeaded, long-faced aristocratic Russian type,—the degenerate escendants of the Scandinavian aristocracy which imposed self on the square-headed Muscovite with Rurik's invasion.

AFGHAN ETHNOLOGY.

In Afghanistan the racial conditions are extremely complicated. The majority of the population are square-heads of the kind commonly called Mongoloid, though personally he prefers the title Japhetic. Chiefly they are Hazaras (a remnant of the Khazar Tartars) or Khirgiz or Usbegs,—Tartar nomads from Turkestan and the country North and West of the Pamirs.

The long-headed Semitic people are in the minority. But, being what they are, they are a governing minority. The est of them are out-and-out Pathans (or more properly akhtans), chiefly Duranis or Ghilzais. These are the two ue Afghan tribes in Afghanistan which really count.

There are also among the long-headed population a number of Persians, indigenous to the Persian side of the country, and naturally a number of Syrians, Jews and Arabs who have settled in the country as traders. Among the Syrians is the Tarzi family to which belong the Foreign Minister Sardar Mahmud Beg Khan and his daughter, the beautiful Queen Sourayya.

King Amanullah himself is a Durani. This tribe is less Nordic in its physical characteristics than are the Ghilzais of Afghanistan, or than the Yusafzais and Khattaks, the chief tribes of the No-Man's-Land which lies between the Afghan border and that country, called the North-West Province, which is definitely under the Government of India, though it is no more a part of India, so far as its people are concerned, than England is a part of France.

The Durani is much more like the Arab or the Sephardim Jew in appearance, and is also much cleverer and more subtle, which accounts for the Duranis being the strongest political influence in Afghanistan.

THE ORIGIN OF THE PATHANS.

Ethnologically all Pathans are Afghans and all true Afghans are Pathans. Irrespective of the side of the Border on which they live, they call themselves the people of the Beni Israel. This is not a matter of claiming to be Israelites on the strength of recent theories. It is simple tribal history handed down from generation to generation. As the period covered is only some 2,500 years, and as they have kept themselves practically unmixed with other tribes by keeping to one limited area, there is no reason to suppose that they have picked up their family history from legends outside their own peoples.

They came into Afghanistan, and thence into the Border Hills, within the last few hundred years—at any rate since 1000 A.D.—and they trace themselves back to somewhere in the direction of Bokhara, whither they came, either by way of the Caucasus or round the South of the Caspian Sea, from Asia Minor. Thus they would seem to be without doubt a remnant of those Israelite tribes which were parked in Asia Minor all the way from Aleppo to the Caspian by the Assyrian Emperors who carried the people of Israel into captivity because they were a continual menace to peace so long as they were allowed to live in Palestine.

Apparently this Pakhtan remnant settled at Bokhara when the Israelites, who had increased to millions during a captivity of some hundreds of years, had broken through the Caucasus after the destruction of the Assyrian Empire by Cyrus of Persia (assisted by our old friend Xenophon), about 600 B.C. The rest of the tribes having swept back and forth across Southern Russia for a while as Skythian nomads, then proceeded to occupy Northern and Western Europe as Goths.

It is well to remember that the Jews are simply the tribe of Judah, who were sent back to Jerusalem by the Persian conqueror Cyrus, at the request of the prophet Daniel, to re-build Solomon's temple. People are apt to forget that there are millions of Semitic people who are not Hebrews, dozens of nations who were Hebrews but not Israelites, and eleven tribes of Israelites who were not Jews. Yet to the average man the term Semite, Hebrew or Israelite means Jew and nothing else. And he does not know enough to distinguish between the Semitic (or Sephardim) Jew from Palestine, and the Russian (or Ashkenazim) Jew who is not a Jew at all, but a Japhetic Tartar whose tribe adopted the Jewish religion only 1,300 years ago.

These facts are worth noting because they explain the physical and mental similarity of the Pathan Israelite to the inhabitants of Western Europe, and his complete difference from the square-headed people, Tartars, Uzbegs, Khirghiz, Turkomans and so forth to his North and West, and from the mere Dravidian Indian to his East.

Also the facts are of vast political and military importance because, in dealing with a Pathan, one must always remember that one is dealing with a white man,—in spite of his religion and his Oriental surroundings.

The poorer class of Pathan is uneducated, but his mental processes are easy to follow because they are just those of the Englishman of about the period of the Norman Conquest. He may be a ruffianly cut-throat, but he is a sportsman, and he has a sense of humour which is strikingly like our own,—and quite different from that of even the Mediterranean French or Italians.

The educated Pathan is even easier to deal with, because he thinks as we do and absorbs his education as we do, instead of getting everything mixed up the wrong way as does the Indian Baboo and the Egyptian and any other people who are distinctly coloured folk. Talking to an educated Pathan is rather like talking to an Englishman who has been abroad so long that he has forgotten some of his vocabulary, and has acquired a strange accent.

Tht Importance of Afghanistan.

Herein, then, lies the importance of Afghanistan to the British Empire in India, and to the Air Force who will have to do so much flying over Afghanistan. So long as the true Afghans, or at any rate their rulers, understand what the power of England means they will understand also that in any future war it will pay them to be on our side rather than on the side of Russia. But,—and here is the point on which our politicians, and our statesmen, if and when we have any, must be watched,—we on our side must see to it that in such a war we do not let down our Afghan allies as in the last war, and those before it, we have let down those small nations which, knowing the ultimate power of England, have come in with us at the start and paid dearly for it when, by waiting awhile until our military effort had fully developed, they might have saved themselves from disaster. Belgium, Serbia and Roumania will serve as recent instances.

King Amanullah's Experience.

This visit to Europe has been King Amanullah's first experience of Western power. Whether he found any connection between that power and true civilisation only he can judge. But the experience certainly must have been a useful education. And his progress through Europe was all in favour of his going home with a proper understanding of the power of England.

In Italy, France and Germany, each by turn, he was received with due honour and was shown everything on which each country prided itself. Before he reached England he had acquired a very good idea of what Europe can show in the way of man-power and machine-power, both for industrial and war-like purposes.

Having thus acquired enough knowledge to give him a fair basis for comparison he then came to England where, one may fairly assume, a man of his very high intelligence must have been deeply impressed by our immense resources in men and material,—an impression which would be increased by the fact that, compared with Continental countries those resources are packed within such a comparatively small space. To travel from one great industrial centre to another in an hour or two, through country which is obviously thickly inhabited, must naturally have been more impressive than seeing a similar display of industries spread over vast and thinly populated territory.

After his visit certain German and French papers complained that, in spite of all the honour which had been shown to him, he left those countries without ordering enough of their products to justify the trouble which had been taken over him. Here in England nobody has so much as hinted that we expected orders from Afghanistan for anything. We are content to let him see England for himself, and to form his own judgment of us as a nation, and of our value as a neighbour in India.

There were, at any rate, two things in England which must have impressed King Amanullah more than anything of a similar kind in other countries. One was the R.A.F.'s display at Hendon and the other was the display of mechanical warfare in Dorsetshire,—though he did not see our new Carvalry, as some would-be humorist has called our recently mechanised horsemen.

So long as he and his astute Syrian Foreign Minister, who is also his father-in-law, were adequately impressed by those displays we need worry about little else. Both are clever enough to know that a country which can show so much in time of peace can, with the resources which they have seen, produce all that is necessary in time of war. And, appreciating those facts they will realise that they will be wiser in future to be our friends than our enemies.

Impressing Potentates.

We English have always had our own curious way of impressing foreign potentates, great or small. There is a legend, probably based on fact as are all legends, that after Waterloo, Marshal Blücher, who commanded our gallant German allies against Napoleon, driving through London with the Duke of Wellington amid the acclamations of the crowd, looked around him at our magnificent buildings and remarked to the Duke, "What a city to loot!" But apparently its magnificent lootability impressed him as evidence of our immense resources, and for almost a hundred years thereafter Germany was our very good friend.

At the other end of the scale, there is also a story which is worth telling. Many years ago there was a young British officer in West Africa who, with the help of a few British N.C.O.s and some Hausa soldiers, controlled quite well an area about the size of England. On the border of his area lived a king who made himself a nuisance by raiding this officer's area and by looting trade caravans passing through his own country.

The British officer sent to the native king and told him that if he did not behave there would be serious trouble, and he suggested that the king should come down to the border and have a talk with him. The king came, and the British officer promised that if he would come into the British camp to a palaver, he would be returned to his tribe unhurt. The king duly arrived and was promptly seized and tied up. Thereafter he was put into a boat and sent down The River to a British port.

In the evening the tribe sent in to know what had happened to their king and reminded the British officer, who has never broken his word, that he had promised to return their king unhurt. He answered that his promise would be kept and that the king would be returned unhurt, but not for some little time, and in the meantime they had better stay quiet and behave themselves.

Meantime, at the British port, the king was taken for rides in motor-cars, and he was shown field guns and machine guns in action. Also he was put on board a small warship, never having seen the sea before, and he was taken right out of sight of land where the warship fired its guns and blew targets to pieces for his education.

After about a week of that sort of thing he was returned to his tribe, complete with frock-coat and tall hat. And so the British officer kept his word and we never had any more trouble from that king.

Even the Kaiser Wilhelm II, who frequently visited England though he did not like his uncle, King Edward VII, was so impressed by the mighty resources of England that, although he built up the great German Military organisation to protect his country against aggression by Russia and against the revenge of France, he did his very best right up to the outbreak of war in 1914 to prevent any conflict with England. It was not his fault that France chose to ally herself with Russia, the natural enemy of Western Europe, and that we got dragged into the War through our guarantee of Belgium integrity.

The Russian Visit.

King Amanullah is to go home by way of Moscow and the Union of Socialist Soviet Republics, which is the modern name for Russia. He is not likely to see anything in Russia to counteract what he has seen in Western Europe. Being a Pathan and therefore racially a Westerner, he is not likely to find himself much in sympathy with the square-headed Tartar Jews who rule Russia. Being a Durani, he is not likely to be taken in by their protestations of goodwill towards his kingdom. And, being a King, he is not likely to think highly of the principles of Bolshevism.

The particular type of low cunning which is characteristic of the square-head is not likely to deceive him. An example of this cunning was shown a few weeks ago when, after the statement was issued that King Amanullah was to go home without visiting Russia, the Soviet Government sent out a news paragraph,—which was unfortunately rather stowed away in the corners of the English papers instead of being held up as a colossal joke,—to the effect that a rebellion had been instigated in Afghanistan by British provocative agents, so as to bring the King home quickly and thus prevent him from visiting Russia.

In Russia he will doubtless be shown a large amount of the Red Army and, of course, the Red Air Force, which has a large number of aircraft, will do its best to impress him. And, of course, he will be told a lot about the Soviet Department of Chemical Warfare, which is bound up with the Red Air Force. But after having seen European troops with their latest mechanical equipment and after having seen air forces as demonstrated in Italy, France and England, he and his ministers are now knowledgeable enough not to be impressed by mere numbers.

The Political Position.

So far as can be gathered, King Amanullah's ambition is to open his Kingdom to those modern developments which are commonly known as Civilisation.. He is credited with a desire to build proper roads throughout Afghanistan. Those roads would be a distinct convenience to Russian armies endeavouring to invade India. But equally they would be a convenience to British armed forces protecting his Kingdom against a Russian invasion. And, we may reasonably conclude that a king who desires to remain a king would rather

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be backed by the forces of our King-Emperor than by the hordes of a Bolshevik Republic.

So far as India is concerned, we may also assume that in spite of the doctrine of "India for the Indians," the British Government will take the trouble to defend India against Russian invasion.

Many of the leaders of the politically-minded section of the many different peoples of India are so foolish as to think that all India can be made into one nation. Which is rather less possible than it would be to make all Europe into one nation. And many of our English politicians are so lamentably ignorant as to think likewise that all the rival kingdoms, peoples and races of India can be made into one nation with one national policy.

Quite recently certain Swarajist members of the Indian Assembly made a tour of the North-West Frontier with the idea of spreading the doctrine of the Freedom of India. At a meeting at Peshawar one of these silly people said that an Afridi chief had told their party, at a meeting in the Khyber Pass, that the Afridis were a free people and that the Indians wanted freedom and that therefore there should be friendship between them. This, the Swarajist said, showed the fundamental unity of the Indian peoples.

The Afridi, a Pathan of Pathans, is a wily bird, and the politically-minded Indian is essentially a fool. There has long been a saying on the Frontier that if the British withdrew from India there would not be within six months piece of gold or a virgin left in the Ganges Valley. Freedor for India, of the kind desired by the Swarajists, would mea for the Afridi and his cheerful cut-throat friends perfec freedom to loot to his heart's content. So one can we understand the Pathan's desire for freedom for the India

Even in India itself the majority of people, natives an Europeans alike, are ignorant of the fact that India begin at the Indus and that the greatest insult to the Punjabi, c his first cousin the Pathan, is to call him an Indian. S we poor English are as usual forced to "take up the Whit Man's burden" and protect the native against his own folly

When left open to looting by the Pathans or to invasio by Russian Armies, the Indian native would be the suffere in the end. No amount of "Indian Sandhursts" woul ever make the Dravidian able to defend himself,—as has bee shown by countless invasions in the past, before and sinc the Moghul (or Mongol) invasions. We English make handsome profit out of our trade with India, but we do nc loot. So any Indian other than the fool-Babu sort wishe us to remain and to keep the Pax Britannica in the country

To keep that peace the first necessity is to hold the Afgha Frontier. It can best be held by Air Power. And with th good-will of the King of Afghanistan, not only can we protect our India, but we can assure to him the safety of hi own Kingdom.—C. G. G.

A SOVIET-AFGHAN AIR AGREEMENT.

A technical agreement between the Afghan and Soviet Air Departments has been concluded, establishing an air service between Kabul and Tashkent.

Both Governments agree to employ only their own nationals and to supply and equip the necessary ground establishments, and it is believed that one of the clauses of the agreement precludes the purchase of aeroplanes and engines from any other country than Russia.

The Soviet Government are providing landing grounds at Tarmez, Samsun, Samarkand and Tashkent, with rest houses for Afghan pilots at Tashkent and Tarmez, and the Afghan Government are providing similar accommodation for Russian personnel at Kabul and Mazarisharif.

The Soviet Government has nominated five pilots and five mechanics, who will be employed on the service, and the Afghan Air Department has so far chosen one pilot and one mechanic, but others will be proposed later.

Oil and accessories will be sold by one department to the other at cost price within the respective zones.

Machines will leave Kabul on the 1st and 15th of each month, and Tashkent on the 18th and the 28th. The fare between Kabul and Tashkent will be £27 10s. Luggage up to 8 kilogs. (17 lbs. approx.) will be allowed free, with a charge of 8s. for each additional kilogram.

PLANS AND OPERATIONS.

As the result of the report on the Air Debate in the House of Commons which appeared in this paper the following letter has been received from Lt.-Cdr. the Hon. J. M. Kenworthy, R.N., M.P. :—

Sir,—With reference to your report of the debate in Parliament on the Air Estimates in your issue of March 21, I find that in the running commentary which your Parliamentary correspondent has made he has quite misunderstood the purport of certain remarks of mine on Staff organisation at the Air Ministry.

First as to Operations and Intelligence being in one division. This may be for reasons of economy, but it is quite wrong from the Staff point of view. The work of these two departments is absolutely distinct and should be kept distinct, and I think I shall be borne out in this by all experienced staff officers.

Secondly as to the making of plans, I was referring to strategical plans *in war time* and not the plans of new works and buildings. The very essence of an efficient Staff is that one department should take over the day to day administrative work including the operations, supply, etc., and the other department, altogether freed from routine, should think out the strategical plans, especially the plans for offensive operations.

We found as the result of bitter experience of two years of warfare that we needed such a Department in the Admiralty, and as I was one of the original five officers chosen to form it I think I can claim to know something of what I am talking about.

All the great principles of strategy are common to the Navy, the Air Force and the Army. Nor should your Parliamentary correspondent assume that I have a very slight knowledge of the Air Ministry organisation; because for a time I acted as liaison officer between the Admiralty Plans Division and the Air Staff during the most critical period of the war. (Signed) J. M. KENWORTHY.

Lt.-Cdr. Kenworthy's letter is distinctly interesting and one is glad to see a Member of Parliament of his Naval experience taking so vivid an interest in air affairs. One would suggest to his further consideration the proposition that Intelligence, including what is commonly called Secret Service, must be under the same Chief-of-Department as Operations. If the collection of intelligence about the warlike affairs of all nations were not under the same Chie as Operations surely the General Staff would have considerable difficulty in planning their operations. For thei work they need to have at their command every bit c intelligence which is acquired by "I" branch.

The Air Force list certainly does show Operations an Intelligence under the same Directorate, but we must remember that in a directorate there may be departments, eac of which does its work in co-operation with the other but unhampered by it. One does not profess to be informed as to War Office organisation, but at any rat "M.I." (Military Intelligence) must obviously be insid "G" (General Staff) and not in "Q" (Quartermaste General); for it must be inside one or the other.

As to Plans, in one's comments one was merely bein mildly facetious. But all the same, plans for new work and buildings do come within the purview of strategica plans. For example, putting the Training Establishments —the Cadet College, the Flying Training Schools, th Central Flying School and so forth,—all in the Lincolnshir area, and putting all the Fighting and Bombing Squadron of the Defence of Great Britain in the Southern and Centra part of the country, is distinctly part of a strategical plan

When the location of the establishment is decided, th further decision as to which of those establishments are t have big permanent buildings and which are to carry o temporarily in war-time huts also becomes part of th strategical plan. Such decisions are analogous to the decisions in earlier history as to where great fortresses wer to be built. And surely that is very much an affair of th Higher Strategy.

Reference to the Air Force List shows that inside th Directorate of Operations and Intelligence there is also Planning Division, which presumably deals with the genera strategy for almost any possible future war, in which w may be concerned.

One does not imagine that it goes as far as the American do in such matters as ear-marking each firm which can b used for the production of aircraft material in the nex war, and seeing that each such firm has complete working drawings of the particular material which it will have t make, and watching that firm make samples of that materia once a year. But one may be pretty sure that the Plannin Division does plan projects for the next war in considerably more detail than did any of our Fighting Service before the War 1914-18.—C. G. G.

INTER-'VARSITY.

It is reported that the Universities of Oxford and Cambridge have been invited to join the Universities of Harvard, Yale, Pennsylvania, New York and Richmond an the Massachusetts Institute of Technology in an inter-collegiate air race. The race is to be held at New York o June 30 under the auspices of the National Aeronautica Association.

A trophy and a substantial prize fund has been offere by Mr. Grover Loening. The trophy and medals will b presented to competitors, and in addition cash prizes will b awarded to the University or College Flying Club as follows:—1st prize, $500; 2nd prize, $300; 3rd prize, $200 and a sum of $1,000 will be divided among all competitors who qualify as a contribution towards their expenses.

Perhaps some Rhodes Scholars in America will oblige.

The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier "Lion" engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

THE POLAR FLIGHT.

On April 15 Capt. G. H. Wilkins and Mr. Carl B. Eielson left Point Barrow, Alaska, on a Lockheed Vega monoplane (225 h.p. Wright Whirlwind engine) to fly across the top of the World to Spitzbergen.

The machine loaded weighed 5,200 lbs., and three attempts to get off failed owing to the skis breaking. The prepared runway was lengthened to 3,500 ft., but finally it had to be abandoned in favour of a new runway 5,000 ft. long, some five miles from Point Barrow. In the final attempt the machine lifted 1,000 ft. from the end of the runway.

After flying for 13 hours through cloudbanks and patches of clear weather fleeting glimpses of the tops of the mountains of Grant Land were seen. Three hours after sighting Grant Land one lone peak of the most northerly end of Greenland was sighted.

At 18.15 hours (local time) on April 16, just 20 hours after leaving Point Barrow, Svalbard (Spitzbergen) was sighted, and a safe landing was made 20 minutes later.

It was not until April 21 that the weather was fit again for flying. Two attempts were made to get off, but each time Capt. Wilkins, who had to give it an initial start, was unable to get on board in time. On the third attempt the machine got off with its full complement, and 1½ hours later it arrived at Green Harbour Ice Bay, Spitzbergen, where it will have to wait until the ice breaks up and enable a steamer to reach Spitzbergen.

In all 2,200 miles were covered in 21½ hours' flying time.

It is said that the object of the flight was to cross the Polar Sea by a route most likely to lead to the discovery of land. Capt. Wilkins has telegraphed to the American Geographical Society reporting that he followed the predetermined course, but sighted no land.

Capt. Wilkins, M.C., is an Australian of an adventurous nature. He took film pictures of the Turkish Forces in the Turko-Bulgarian war of 1912. From 1913-17 he was with the Stefansson Arctic Expedition. In 1917 he was given a commission in the Australian Flying Corps as an official photographer and was awarded the Military Cross and Bar.

In November 1919 he left Hounslow in company with three other officers in a Blackburn Kangaroo in an attempt to fly to Australia, but the machine was wrecked at Suda Bay, Crete.

In 1920-21 he was with the British Antarctic Expedition, and immediately afterwards he joined the Shackleton Expedition to the Antarctic as naturalist. In 1923-25 he was engaged as a naturalist in collecting specimens for the British Museum in Northern Australia.

In 1926 and 1927 he made several attempts to fly over the Polar Sea from Alaska, but was unsuccessful in all these attempts.

PARIS—ALGIERS NON-STOP.

On April 18 M. Détroyat, who is preparing for a long-distance flight to an unknown destination, which does not involve a crossing of the Atlantic, left Le Bourget at 04.00 hrs. in an attempt to fly to Algiers and back without a stop. He arrived at Algiers at 14.00 hrs. and landed there, as th strong wind would not have allowed of the return fligh being completed with the amount of petrol available in th tanks.

M. Détroyat is using an Avimeta 92 monoplane (200 h. Wright Whirlwind engine). The machine, which in outli closely resembles the Ryan monoplane, is of all-metal co struction and was described in THE AEROPLANE for Jan. 1 1928. The cabin portion has been filled with tanks, and th pilot's cockpit removed aft of the trailing edge of the win inside the fuselage. The span has been slightly increase and a Wright Whirlwind engine has been substituted f the 200 h.p. Salmson engine originally fitted.

THE JAPANESE PACIFIC FLIGHT.

It is reported that three Japanese attempts will be made th summer to fly from Tokyo to Seattle across the Pacific.

To eliminate the large number of applicants for the pos of pilot, a unique test has been introduced. All intendin applicants have been forced to walk round a marked circ on the aerodrome for fifty hours without sleep or rest, foo being given to them while in motion. This test eliminate all but ten applicants.

In the meantime the Japanese authorities have questione the airworthiness of at least one of the machines under co struction.

THE THOUSANDTH JUNKERS AEROPLANE.

During the next few days the Junkers Flugzeugwerks A. will complete a new three-engined machine of the G31 typ which will be the thousandth aeroplane of Junkers desig and construction to be completed. The Junkers firm adm that certain other large aircraft factories have produced many as, and in some cases more than, this number of aer planes, but that all these outputs have very largely co sisted of military aircraft, whereas their own output mainly composed of civil aircraft produced since the war.

To celebrate this occasion the firm has issued an illu trated pamphlet, giving specifications and illustrations all their present aircraft, and much interesting informati as to their construction and the work to which they ha been put throughout the world.

NEW U.S. AIRSHIPS.

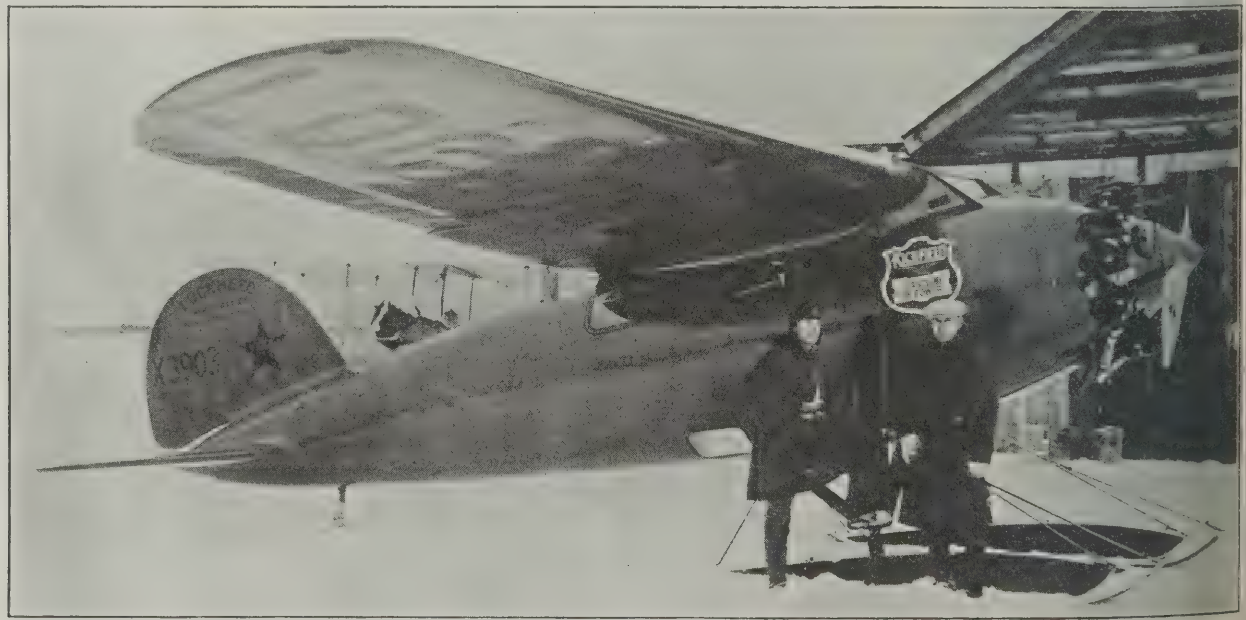
The U.S. Navy Department is inviting tenders for t construction of two airships which were authorised so time ago by Congress.

About $8,000,000 (£1,600,000) will be expended on the airships, which are to be 787 ft. long, to be capable carrying five aeroplanes and to have a cruising radius 11,200 miles.

Tenders must be submitted by July 26, 1928.

SQUADRON LEADER HINKLER, A.F.C., D.S.M., R.A.A.F.

The Australian Federal Government has conferred Mr. Hinkler an honorary commission as a Squadron Lead in the Royal Australian Air Force.



THE POLAR FLIGHT.—The Lockheed Vega monoplane (225 h.p. Wright Whirlwind engine) in which Capt. G. H. Wilkins, M.C., and Mr. Eielson flew from Point Barrow, Alaska, to Green Harbour, Spitzbergen, across the North Polar regions, a distance of 2,200 miles, in 21½ hours' flying time.

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TELEGRAM 19. 10 27.

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ENGINE RAN FAULTLESSLY THROUGHOUT FLIGHT. HEALTHY EXHAUST NOTE INSPIRED PEACE OF MIND OVER SEA AND FOREST. RETURNED PRETORIA VIA EAST COAST MAKING TOTAL MILEAGE 9,000 APPROX MATELY.

BENTLEY.

TELEGRAM. 19. 3. 28.

AIRDISCO, LONDON.

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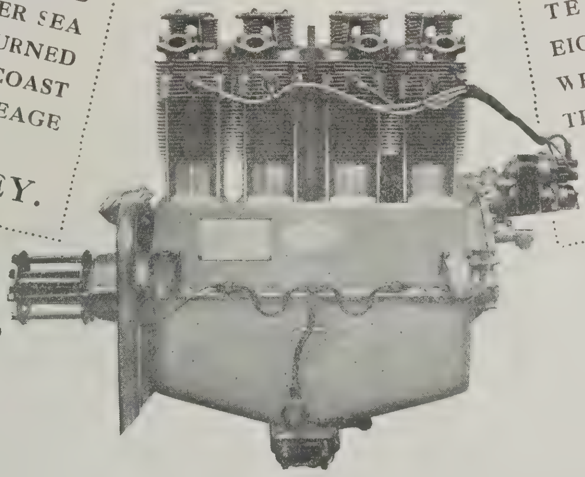
LANCASTER.



30/80 h.p.

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30/80 h.p.

"CIRRUS"

TELEGRAM. 4. 4. 28.

AIRDISCO, LONDON.

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THE ROYAL AIR FORCE.

The London Gazette.

April 17.

GENERAL DUTIES BRANCH.—The following Plt. Offs. are promoted to the rank of Flg. Off. (Jan. 30) :—W. G Abrams, C. E. Chilton, R. S Darbishire.

Air Vice-Marshal Charles L. Lambe, C.B., C.M.G., D.S.O., is placed on the half-pay list, scale A, April 1 to May 13, 1928, inclusive.

Flg. Off. E. J. Spearing is placed on the retired list (April 18). Flg. Off. R. H. Bibby is transferred to the Reserve, Class C (April 15). Plt. Off. G. N. Hoar relinquishes his S.S. comn on account of ill-health (April 16). The notification in the *Gazette* of Mar. 27 regarding Flg. Off. R. B. Fleming is cancelled.

MEDICAL BRANCH.—The following Flg. Offs. are promoted to the rank of Flt. Lt. (April 14) :—R. J. I. Bell, R. G. Freeman.

RESERVE OF AIR FORCE OFFICERS.—GENERAL DUTIES BRANCH.—J. M. Longley is granted a comn. in Class A.A. as a Plt. Off. on probation (Apr. 2). The following Plt. Offs. on probation are confirmed in rank :—J. D. Williamson (Mar. 19), O. F. MacLaren (Mar. 21). Flg. Off. F. G. Sinclair is transferred from Class C to Class A (Mar. 30); Flg. Off. R. T. Halliwell is transferred from Class A to Class C (April 10). The following relinquish their comns. on completion of service :—Flg. Off. E. H. Bird (Dec. 16, 1927), Plt. Off. T. N. Drake (April 1).

PRINCESS MARY'S R.A.F. NURSING SERVICE.—Sister Miss Isabelle D. Mardon resigns her appointment (Mar. 6).

Appointments.

Week ending April 23.

GENERAL DUTIES BRANCH.—Air Commodore I. M. Bonham-Carter, C.B., O.B.E., to H.Q., Halton, on appointment as Air Officer Commanding, 1/4. Group Captain C. R. S. Bradley, O.B.E., to Special Duty List, on appointment as Air Attaché, Rome, 30/3.

Wing Commanders J. N. Fletcher, A.F.C., to R.A.F. Depot, Uxbridge, 30/3. G. R. Bromet, D.S.O., O.B.E., to M.A.E.E., Felixstowe, pending taking over command, 16/4.

Squadron Leaders G. F. Breese, D.S.C., to R.A.F. Training Base, Leuchars, 16/4. G. C. Bailey, D.S.O., to Air Ministry, Directorate of Equipment, 15/5. S. R. Watkins, A.F.C., to H.M.S. *Courageous*, 21/2.

Flight Lieutenants D. Drover, to H.M.S. *Courageous*, 11/4. E. T. Carpenter, A.F.C., and A. W. Franklyn, M.C., to H.M.S. *Courageous*, 21/2. E. P. Mackay, to R.A.F. Depot, Uxbridge, 22/3. D. Colyer, D.F.C., to No. 4 F.T.S., Egypt, 5/4. G. O. Venn, to Aircraft Depot, India, 18/3. A. C. B. Harrison, M.C., to H.Q., R.A.F., India, 20/3. F. J. Fogarty, D.F.C., to No. 84 Sqdn., 'Iraq, instead of to No. 30 Sqdn., 'Iraq, as previously notified, 23/2. R. G. P. Ovenden, to H.Q., R.A.F., Middle East, 5/4. W. J. M. Akerman, to No. 31 Sqdn., India, 23/3. S. D. Macdonald, D.F.C., to C.F.S., Wittering, 24/4. J. F. Lawson, A.F.C., to H.Q., Inland Area, Stanmore, 13/4. E. P. M. Davis, A.F.C., A.M., to No. 7 Sqdn., Worthy Down, 15/4. G. O'Donnell, D.F.C., to R.A.F. Depot, Uxbridge, 2/4. D. C. Prance, Electrical and Wireless School, Flowerdown, 5/4. C. Porri, D. Ward and D. H. Carey, to H.Q., Coastal Area, 1/2. W. H. Golde D.S.M., to H.Q., Coastal Area, 15/5. N. H. Jenkins, O.B.E., D.F.C D.S.M., to No. 84 Sqdn., 'Iraq, 8/3 C. G. Halliday, to Aircraft Depo 'Iraq, 9/3. G. H. Smith, to No. 30 Sqdn., 'Iraq, 8/3. H. M. Masse M.C., to R.A.F. Cadet College, Cranwell, 5/4. M. M. Freehill, D.F.C and H. G. Kirkham, to No. 2 F.T.S., Digby, 5/4. C. R. Smythe, No. 5 F.T.S., Sealand, 5/4. D. M. Fleming, to No. 3 F.T.S., Grantha 5/4.

Flying Officers N. H. N. Fletcher, A. L. R. Duke and W. Lovering, to No. 1 F.T.S., Netheravon, 5/4. V. B. Bennett, to No. 6 (City of Edinburgh) Sqdn., 5/4. B. C. Mason, L. G. Gray and L. Mason, to No. 3 F.T.S., Grantham, 5/4. M. W. Goldie, to R.A. Cadet College, Cranwell, 5/4. G. H. Walker, to No. 5 F.T.S., Se land, 5/4. A. W. Whitta, to No. 2 F.T.S., Digby, 5/4. L. T. Kerr M.C., to H.Q., 'Iraq Command, instead of to Armoured Car Win 'Iraq, as previously notified, 23/2. J. R. Brown, D.F.C., to R.A. Depot, Uxbridge, 22/3. M. Wiblin, to C.F.S., Wittering, 2/4. D. Shaw, to No. 1 School of T.T., Halton, 1/4. A. L. Mortimer, M.A.E.E., Felixstowe, 29/3. R. Costa, to No. 2 F.T.S., Digby, 20/ A. E. Groom, D.S.M., to R.A.F. Station, Bicester, 3/3. N. C. Ogilv Forbes, to R.A.F. Cadet College, Cranwell, 16/4. J. J. Nolan, to No. Sqdn., 'Iraq, 8/3. H. V. Smith, D.C.M., to Aircraft Depot, 'Iraq, 9/ E. B. Forster and P. B. Chubb, to No. 84 Sqdn., 'Iraq, 8/3. C. Lock, L. H. Ross and W. F. Rimmer, to No. 55 Sqdn., 'Iraq, 8/3. J. Yonge, to Experimental Section, R.A.E., S. Farnborough, 11/4.

Pilot Officers T. C. Dickens and C. S. Ellison, to No. 1 F.T.S Netheravon, 5/4. A. P. de Woulf de Wytt, to A. and G. School, Eas church, 2/4. F. H. L. Searl, to No. 17 Sqdn., Upavon, 5/ M. Fountain-Barber, to No. 4 Sqdn., S. Farnborough, 15/4. C. Hockly, to No. 2 Sqdn., Manston, 3/4. F. R. Balfour, and C. Davies, to R.A.F. Depot, Uxbridge, on appointment to S.S. Comns 18/4. The undermentioned Pilot Officers are posted to the R.A. Depot, Uxbridge, on appointment to S.S. Comns. with effect 13/4: J. Addison, D. A. L. Campbell, H. H. Chapman, P. L. M. C. Deaco J. W. Hawke, F. R. Jones, W. H. Jones, H. Kerr, H. D. McGrego G. F. MacPherson, R. G. Walley, E. S. Whitaker and H. J. Williams.

MEDICAL BRANCH.—Flight Lieutenants A. Briscoe, M.B., to H.Q., Ade Command, 13/4. G. S. Strachan, M.B., to H.Q., R.A.F., India, 13/ C. J. S. O'Malley, to H.Q., R.A.F., Middle East, 30/3. H. B. Trou to A. and A.E.E., Martlesham Heath, 16/4. R. W. White, to R.A. Officers' Hospital, Uxbridge, 19/4.

Flying Officer P. B. L. Potter, M.B., to Special Duty List, on appoin ment to a S.S. Comn., 28/3.

STORES BRANCH.—Flight Lieutenants W. R. P. Allen, to H.Q., R.A.

IN THE AKWAN AREA.—The R.A.F. operations against the Wahabis in February, 1928. At the top is Air Vice-Marshal Sir Edward Ellington, K.C.B., C.M.G., C.B.E., Air Officer Commanding, 'Iraq Command, talking to Mr. C. Leonard Woolley, who is in charge of the excavations at Ur of the Chaldees, during a lull in the fighting, and a Flight of No. 84 (Bombing) Squadron over Zubeir. At the bottom is No. 84 Squadron Officers' Mess at Nugrat Salman built up of empty petrol tins and on the right are some of the Officers of the Squadron. Second from the right is Flt. Lt. J. F. T. Barrett, D.F.C., who was made a Companion of the Distinguished Service Order for gallant and distinguished service during those operations.

Middle East, 28/3. E. R. Wood, to Aircraft Depot, India, 13/3. F. E. Shersby, to H.M.S. *Courageous*, 22/2. R. H. Latham, to R.A.F. Depot, Uxbridge, 28/2. J. W. Stokes, to Home Aircraft Depot, Henlow, 20/4.

Flying Officers W. H. Harrison, to No. 1 Stores Depot, Kidbrooke, 31/3. A. M. Reidy, to R.A.F. Depot, Uxbridge, 15/4. M. F. Tomkins, to the Packing Depot, Ascot, 5/4. E. H. Broad, to No. 600 (City of London) Sqdn., Hendon, 16/4. F. E. R. Dixon, M.C., to No. 504 Sqdn., Hucknall, 3/4. A. J. Redman, D.F.C., to R.A.F. Training Base, Leuchars, 10/3.

Pilot Officers C. J. Cousins, to No. 1 School of T.T. (Apprentices), Halton, 6/4. B. Allen, to No. 56 Sqdn., North Weald, 20/4. Thripp and T. A. Head, to No. 1 School of T.T. (Apprentices), Halton, 20/4. H. W. Penney, to No. 13 Sqdn., Andover, 20/4. C. L. Thompson, to No. 600 (City of London) Sqdn., Hendon, 20/4. E. F. Smith, to R.A.F. M.T. Depot, Shrewsbury, 20/4. A. Connock, to R.A.F. Station, Kenley, 20/4. M. M. McMullan, to No. 12 Sqdn., Andover, 20/4. H. J. Butler, to Home Aircraft Depot, Henlow, 20/4 I. A. Wrigley, to R.A.F. Training Base, Leuchars, 20/4. C. M. P. Hartley, to No. 25 Sqdn., Hawkinge, 20/4. O. D. Allerton, to M.A.E.E., Felixstowe, 20/4. M. E. O'B. Atkinson, to R.A.F. Station, Upavon, 20/4. D. G. McDiarmid, to No. 2 Sqdn., Manston, 20/4. H. E. Frost, to No. 9 Sqdn., Manston, 20/4.

ACCOUNTANT BRANCH.—Flight Lieutenants W. R. Westcombe, to Station H.Q., Heliopolis, 30/3. J. M. Adams, to H.Q., R.A.F., Middle East, 5/3. A. J. Moore, to No. 1 School of Technical Training, Halton, 11/4.

Flying Officers D. F. A. Clarke, to H.Q., R.A.F., Middle East, 29/3. W. Freeman, to H.Q., Inland Area, Stanmore, 11/4. D. Sender, to R.A.F. Station, Sutton's Farm, Hornchurch, 1/4. R. S. Sweet, to No. 3 T.S., Grantham, 12/4.

The 1928 Cairo—Cape Town Flight.

The annual Service flight, under the command of Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., which left Heliopolis on Mar. 1, and reached Cape Town on Mar. 24, arrived at Nairobi on April 19 accompanied by a unit of the South African Air Force.

The South African Air Force Flight consists of four D.H.9 machines (400 h.p. Bristol Jupiter engines). It is commanded by Capt. C. J. Venter, A.F.C. The other personnel of the Flight are Capt. J. C. Hammond, Lieut. H. G. Wilmott, Second Lieut. W. A. Nil, Flt. Sgt. S. J. Brain, and two fitters.

New R.A.F. Equipment.

The programme of re-equipping the Squadrons of the R.A.F. has made some progress since the beginning of the year.

No. 8 (Bombing) Squadron, Aden, No. 47 (Bombing) Squadron, Khartum, and No. 207 (Bombing) Squadron, Eastchurch, have been equipped with Fairey III.Fs (Napier engine), No. (Fighter) Squadron, North Weald, has been equipped with Armstrong-Whitworth Siskins (Siddeley Jaguar engines) and No. 24 (Communication) Squadron has had additional equipment of D.H. Moths (A.D.C. Cirrus engines). It is also announced that No. 101 (Bombing) Squadron is to be equipped with Boulton and Paul Sidestrands (two Bristol Jupiter engines.)

The R.A.F. High-Speed Experimental Section.

A High Speed Experimental Section of the Marine Aircraft Experimental Establishment, R.A.F., has been formed at Felixstowe, which will take the place of the High Speed Flight. The officer in charge of the Flight will be Flt. Lt. D. D'A. Greig, D.F.C., who, when and if he proves himself a satisfactory pilot of high-speed seaplanes, will make an attempt to break the world's speed record, probably in June or July of this year.

Flt. Lt. D. D'A. Greig was born at Elgin, Scotland, in 1900, joined the R.A.F. as a Cadet in 1918, and served in France with No. 84 Squadron. In February 1920 he was posted to No. 6 (Army Co-operation) Squadron in 'Iraq and was awarded the D.F.C. during the operations in Kurdistan. In 1923 he was posted to No. 24 (Communication) Squadron at Kenley, and in 1924 he was posted to the C.F.S., where he was appointed Examination Officer. He underwent a course of navigation at Calshot during 1925, and was posted to H.Q. Fighting Area, Kenley, in 1927. He was promoted to be Flight-Lieutenant in January 1927. Flt. Lt. Greig led the aerobatic formation of Genet Moths at the R.A.F. Display of 1927.

Air Commodore Bonham-Carter.

Air Commodore I. M. Bonham-Carter, C.B., O.B.E., whose appointment as Air Officer commanding, R.A.F., Halton, is dated April 1, 1928, was born in 1882 and educated at Hseley Manor and Haileybury. He entered the 5th Battn. Northumberland Fusiliers (Militia) in 1900 and served with that Regiment in Cape Colony, the Orange River Colony and the Transvaal in 1902 and in the Operations in the Matta and Kargha country, N.W. Frontier of India, in 1908. He learned to fly on a Maurice Farman biplane at Upavon and his Royal Aero Club certificate No. 794 is dated May 25, 1914. He was seconded to the R.F.C. with the rank of Flying Officer in June, 1914, and on Aug. 13, 1914, he went to France with No. 4 Squadron. He was appointed to the Legion of Honour (Chevalier de Croix) France in November, 1914. He was wounded in action at the end of 1914. In April, 1916, he was appointed Staff Captain at the War Office and in May, 1916, he was promoted to be Major, Northumberland Fusiliers. In September, 1916, he was appointed to command an R.F.C. School of Instruction and in July, 1917, he was appointed Commandant of the School of Military Aeronautics with the temporary rank of Lt.-Colonel. At the end of 1917 he was appointed to command the newly-formed School of Technical Training at Halton with the temporary rank of Colonel. He was appointed S.O.1 in April, 1918, and Deputy Director at the Air Ministry in June, 1919. He was appointed an Officer of the Order of the British Empire on Jan. 1, 1919, for distinguished services in connection with the War. In October, 1920, he was appointed to command No. 11 (Irish) Wing, R.A.F., and in February, 1922, when the designation of the Command was altered, he commanded the R.A.F. in Ireland. In August, 1922, when the R.A.F. was withdrawn from Ireland, he was appointed to command the R.A.F. Depot at Uxbridge. He was appointed to be a Commander of the Bath in January, 1923. In October, 1925, he was placed in command of No. 3 (Training) Group at Spittlegate.

Wing Commander E. R. Manning.

Wing Cdr. E. R. Manning, D.S.O., M.C., who has been placed on the half-pay list at his own request in order that he may attempt to fly to Australia in a Westland Widgeon (A.D.C. Cirrus engine), was born at St. Leonards, New South Wales, in 1889 and educated at the Sydney Grammar School, Bedford Modern School and Edinburgh University Medical School. He joined the Lothian and Border Horse in August, 1914, and was granted a commission in the 14th Reserve Regiment of Cavalry in September, 1914. He learned to fly on an L. and P. biplane at Hendon and his Royal Aero Club certificate No. 2253 is dated Jan. 9, 1916. He was seconded to the R.F.C. with the rank of Flying Officer in June, 1916, and posted to No. 23 Squadron in France. In 1917 he served with No. 28 Squadron at Gosport and later returned to France where he was awarded the Military Cross for conspicuous gallantry and devotion to duty. In 1920 he was posted to No. 2 F.T.S., Duxford, and in 1922 he was appointed to command No. 6 (Army Co-operation) Squadron in 'Iraq. During the operations in Kurdistan between February and June, 1923, he was made a Companion of the Distinguished Service Order. In 1924 he was posted to No. 4 F.T.S., Egypt, and in September, 1925, he was restored to the Home Establishment and underwent a course at the London University School of Economics. In April, 1926, he was appointed Personal Assistant to the Chief of the Air Staff and in November of the same year he commanded the School of Naval Co-operation at Lee-on-Solent. In December, 1927, he was posted to the R.A.F. Depot at Uxbridge.

Wing Cdr. E. R. Manning, D.S.O., M.C., R.A.F., flying a Westland Widgeon monoplane (A.D.C. Cirrus engine), left Lympne at 05.30 hrs. on April 23 and reached Marseilles on the same day.

Extension of Service.

Air Ministry Orders state that the following officers holding short service commissions have been selected for extensions of service on the active active list of the R.A.F. The extensions now notified are in substitution of any extension previously granted to any of these officers.

General Duties Branch :—Selected for extension of Active List service to June 30, 1928, Flt. Lt. D. E. Ward. Selected for extension of Active List service to Oct. 31, 1928, Flg. Offs. A. E. Piash, G. J. Southam, H. M. S. Wright. Selected for extension of Active List service to seven years, Flg. Offs. R. B. Fleming, G. H. W. Selby-Lowndes, C. W. McK. Thompson. Selected for Active List service to six years, Flg. Offs. H. W. David, H. S. Dawe, H. D. Michelmore, G. A. Simons and N. J. Wiltshire.

Accountants Branch :—Selected for extension of Active List service to six years, Flg. Off. C. B. Rawlings, M.C.

Medical Branch :—Flt. Lts. G. M. Anderson, M.B., W. D. McKeown, M.B., J. M. Wilder.

Modern Languages.

Air Ministry Weekly Orders notify that the following airman has passed the examination specified below :—

Middle-East, Jan. 18, 1927 : *Colloquial Arabic*, 349201 Sgt. G. W. Grayson.

The Martlesham Heath Reunion Dinner.

The Martlesham Heath Reunion Dinner, which was unfortunately allowed to lapse a few years ago, is being revived and is to be held on Friday, May 18 next, at the Connaught Rooms, Great Queen Street, London, W.C.2, at 7 p.m. for 7.30 p.m. (Dinner jackets.)

Will any officer who served at Martlesham during 1917 to 1922, and who wishes to attend, please send a cheque for 15s. to E. C. Stringer, Carlton House, Regent Street, London, S.W.1.

MOTH

—THE WINNER!

—IN THE FIRST TWO FLYING MEETINGS OF THE YEAR

LYMPNE

1st **Manufacturers' Folding and Erecting Race.**

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AERONAUTICAL ENGINEERING

SUPPLEMENT TO "THE AEROPLANE"

A SIMPLE CRITERION OF LONGITUDINAL STABILITY.

BY G. B. FENTON, B.Sc. (ENG.) LONDON, of the Technical
Staff of the Blackburn Aeroplane and Motor Co. Ltd.

The mathematical theory of stability, as presented in aeronautical text books, and in the Reports of the Aeronautical Research Committee, though an invaluable guide to a complete understanding of the subject, is admitted to be unsuitable for the purpose of stability prediction as a part of routine design. Any attempt to use the theory during the early stages of design, to predict fully the behaviour and subsequent motion of the machine in a disturbance, involves a lengthy and laborious calculation, and yields results which, even if they can be accepted with any certainty, really tell the designer more than he needs to know at that stage.

The following method of investigation, although having no pretensions to strict accuracy, has given results which justify its use among the standard calculations used in the design of a new machine.

This method consists of estimating, from the fundamental aerodynamic data of the machine, values of elevator angles to trim with various tail settings, and plotting these against either the appropriate speeds or angles of attack.

The curves so obtained, or more particularly the slopes of these curves, give an indication of the longitudinal stability of the machine at all speeds, and by varying the tail area, or position of the centre of gravity of the machine in the calculations, a guide to the correct size and position of these to give the desired stability or slight instability can be obtained.

The elevator angles can, of course, give no information as to the type of stability or instability to be expected. They show only whether the machine possesses any degree of statical, or weathercock stability. The dynamical effects, .e., the actual motions under a disturbance and the consequent damping, can only be investigated by the classical heory.

The fact that the slope of the curve of elevator angle o trim is a criterion of the weathercock stability can be hown as follows :—

Consider a machine flying at any speed with the elevators et to trim, i.e., with the pitching moment due to the ail and elevators exactly balancing the pitching moment ue to the other parts of the machine (mainly the wings). The resultant moment about the C.G. of the machine is hen zero. For convenience, a pitching moment of the machine without tail and elevators will be referred to as M_W, and a pitching moment due to the tail and elevators lone as M_T.

If the machine is in trim, M_W equals M_T, but if a slight isturbance occurs, causing the nose of the machine to be epressed a little, both M_W and M_T will be altered by small nounts which we can call dM_W and dM_T.

In a normal machine, dM_W will tend to depress the nose till further, and dM_T will oppose the depression, the levators being assumed fixed in the original position. Then he stability of the machine as a weathercock depends on he values of dM_W and dM_T.

If dM_T is greater than dM_W, the machine will return to s original attitude, and is therefore stable; if dM_T is less han dM_W, the initial depression of the nose will increase, nd the machine is unstable; if dM_W and dM_T are equal, he machine will stay in the new position and is obviously n a state of neutral stability.

Suppose that instead of being allowed to return to its riginal attitude, or proceed still further from it, the achine is to be held in trim by the elevators in the new titude, i.e., with the nose slightly depressed.

In the first case (stable machine), as dM_T is greater than M_W, the elevators must supply a moment opposing dM_T, nd reinforcing dM_W in order that the machine shall remain in equilibrium in the new position, i.e., they must ve an upload, and the elevators in the final attitude will e at a greater positive angle than in the original attitude. (depression of the elevators is termed positive, and vice-versa.)

In the unstable case, however, the elevators must oppose dM_W and reinforce dM_T, and must therefore supply a download. Their position for trim in the new attitude is thus at a less positive angle than before.

In the case of the neutral machine there will be no difference between the angle of the elevators in the initial attitude and in the final attitude, as there is no change of moment involved for steady flight in either position.

Considering, therefore, a curve of elevator angle to trim (η) plotted on a base of angle of attack (α) of the machine, it will be seen that at any point where the slope of this curve is negative, i.e., η increases negatively with increase of α, the machine will possess a degree of weathercock stability at that particular attitude. Similarly, a positive slope at any point indicates instability, and a zero slope implies neutrality.

Probably a more useful method of presentation is to plot elevator angle on a base of speed. In this case stability is shown by a positive slope (positive increase of elevator angle with increase of speed), instability by a negative slope, and neutrality, as before, by zero slope.

It will be noted that for a stable machine the control movement is in the natural direction, i.e., an increase of speed is allied to a depression of the elevator, and vice-versa, while an unstable machine requires an elevator movement in a direction opposite to that usually associated with a change of trim. It is hardly necessary to mention that this does not mean that a raising of the elevator on an unstable machine will result in a depression of the nose, and a consequent increase of speed. It is obvious that the change of trim will first have to be started in the normal way by a depression of the elevators, but these will have to be raised again to hold the machine in trim in its new attitude, and it will then be found that they are at a less positive angle than before.

The method of obtaining the curves of elevator angle required to trim consists of estimating the pitching moments of the machine (less tail) about its C.G. for all attitudes of flight under two conditions, viz., gliding, and climbing at full throttle. The tail loads required for equilibrium can thus be obtained, and from these the elevator angles necessary with a given tail setting. The case of throttled flight obviously lies somewhere between the extreme conditions of gliding and climbing and, therefore, need not be considered.

The procedure to be outlined contains a number of approximations and empirical factors which are inseparable from a preliminary investigation of this type. The result of these is to make the actual quantitative elevator angle values obtained of rather doubtful accuracy, but as we are only interested in the slopes of the curves, which will certainly be of the right order, this is of little importance.

The pitching moments acting round the Centre of Gravity of a machine in flight are as follows :—

(a) Wing Moments (Moments of Lift and Drag). (b) Parasite Drag Moment. (c) Body Pitching Moment. (d) Thrust Moment (Zero in gliding case). (e) Tail Moment.

(A moment is assumed positive when it tends to depress the nose of the machine.)

(a) WING MOMENTS.

The wing data required is a set of curves showing the lift coefficient K_L, the drag coefficient K_D, and the centre of pressure coefficient Kp, plotted against angle of attack α for the aerofoil section chosen. The section characteristics must first be corrected by the Prandtl Theory for the particular wing arrangement, in the usual manner.

The method of estimating the wing moments makes use of the generally accepted "Equivalent Chord" (for a biplane the ratio of loading is taken as $\frac{\text{Top Plane}}{\text{Bottom Plane}} = \frac{1.2}{1}$ and all wing forces are assumed to act on this equivalent chord. Then, if the co-ordinates θ ft. and ϕ ft. of the C.G. of the machine with respect to the leading edge of the equivalent chord (see figure 1) are known, expressions for

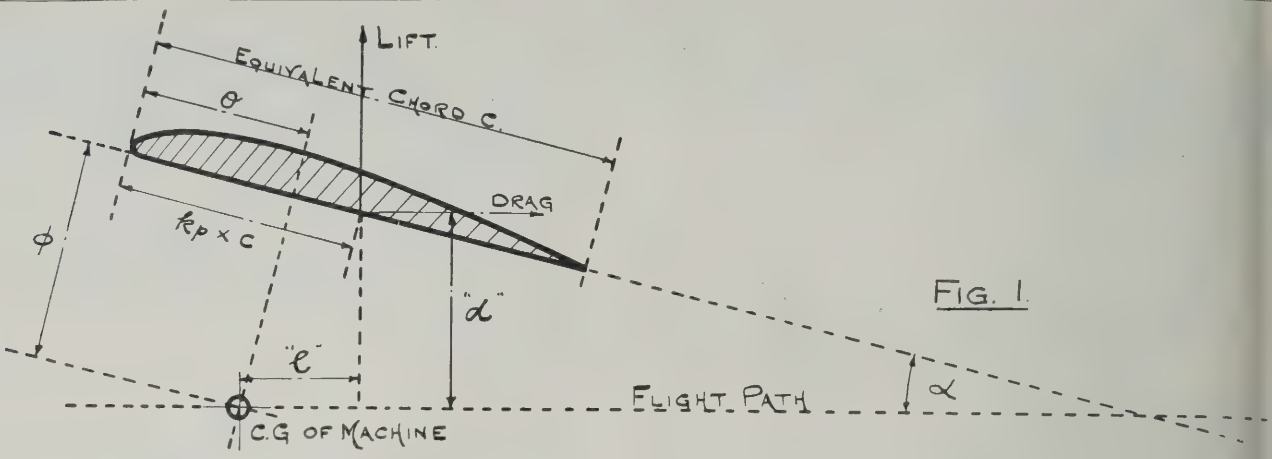

FIG. 1.

"l" and "d," the arms of the lift and drag moments respectively, can be simply obtained.

$$\text{“}l\text{”} = (Kp \times c - \theta + \phi \tan \alpha) \cos \alpha \text{ ft.}$$

$$\text{“}d\text{”} = \left\{ \phi - ([Kp \times c] - \theta) \tan \alpha \right\} \cos \alpha \text{ ft.}$$

where α = angle of attack, c = equivalent chord in ft., Kp = centre of pressure coefficient, and θ and ϕ are as defined above.

Now lift in lbs. $= K_L\rho \; AV^2$ and drag in lbs. $= K_D\rho \; AV^2$, where A = wing area in sq. ft., V = speed in ft./sec., and $\rho = .00237$ at sea level.

Hence :—Moment of lift about C.G. $= K_L \; Al \times \rho V^2$ *lbs. ft.*, and moment of drag about C.G. $= K_D \; Ad \times \rho V^2$ *lbs. ft.*

Using the corrected wing characteristic curves, and the above expressions, find the values of $K_L \; Al$, and $K_D \; Ad$ for a series of angles α. It will be found convenient to leave the term ρV^2 in the expressions for the moments uncalculated till later.

The wing moments are taken to be the same for both the gliding and climbing cases, i.e., the effect of the slipstream is neglected. This is one of the approximations which have to be made to prevent the investigation from becoming too voluminous.

(b) PARASITE DRAG MOMENT.

An estimation of the extra-to-aerofoil drag of a machine is usually made in the process of design, and by using a front view G.A., an idea of the position of the point of application of this resistance can be obtained. Strictly, the parasite drag in the gliding case should be increased by the drag of the airscrew, and in the climbing case by a slip-stream factor, but as the centre line of resistance of a normal machine is usually near the C.G., and the resulting moment consequently small, these refinements may be neglected as having little effect on the final results. They can easily be incorporated, however, if desired.

Then if R = total parasite drag at 100 ft./sec. (obtained from estimate), and r ft. = distance of the centre of resistance from C.G. of machine, then at a speed of V ft./sec. :—

$$\text{Moment of parasite resistance} = Rr \times \frac{V^2}{100^2} = \frac{Rr}{23 \cdot 7} \times \rho V^2.$$

(Note :—r is positive when the centre of resistance is below the C.G.)

The moment should be left in this form of Constant $\times \rho V^2$ for the present.

(c) BODY PITCHING MOMENT.

Satisfactory values for this term can only be obtained from model tests, as it will be considerably affected by the proximity of the wings. These tests will rarely be available, in which case the term may be neglected, as its magnitude is small and will not materially alter the final results.

If, however, tests on the machine, or on a similar machine, have been carried out, it will be found convenient to convert the results into the form :—

$$\text{Body Pitching Moment} = M_B \times \rho V^2.$$

We are new in a position to find the complete M_W of the machine in the gliding case. This is given by the equation M_W = Wing Moments + Parasite Drag Moment + Body Moment,

$$= K_L lA \times \rho V^2 + K_D dA \times \rho V^2 + \frac{Rr}{23 \cdot 7} \times \rho V^2 + M_B \times \rho V^2.$$

$$\therefore \frac{M_W}{\rho V^2} = K_L lA + K_D dA + \frac{Rr}{23.7} + M_B. \quad (1)$$

This expression must be calculated for a series of angles from top speed to stalling, the correct signs being used for the individual terms.

The lift term, $K_L lA$ is usually positive over the greater part of the range, but may become negative at large angles. The drag term, $K_D dA$ will practically always be negative, except, perhaps, in the case of a low wing monoplane. $\frac{Rr}{23 \cdot 7}$ is constant, and its sign will depend on whether the centr line of resistance is above or below the C.G. M_B will b positive at small angles, becoming negative near the stall.

The total M_W will usually be positive but may become negative at large angles if the C.G. of the machine is situate further aft than about 0.3 of the equivalent chord.

(e) TAIL MOMENT.

For equilibrium in flight, the tail must supply a momen balancing M_W. Then if T is the tail load in lbs., and t ft is the distance of the centre of pressure of the tail fro the C.G. of the machine :—

$\frac{M_W}{\rho V^2} + \frac{Tt}{\rho V^2} = 0$ in order that there shall be no resultan moment.

$$\therefore \frac{Tt}{\rho V^2} = -\frac{M_W}{\rho V^2} \quad (2$$

The assumption is now made that the lift on the wings i equal to the weight of the machine + the tail load. This i of course, not quite true for gliding flight but is permissibl for the small gliding angles obtained. On this assumption :-

$$W + T = K_L\rho A V^2$$

Where W = weight of machine in lbs.

$$\therefore \rho V^2 = \frac{W+T}{K_L A} \quad (3$$

Substituting this in the equation for equilibrium we get

$$-\frac{M_W}{\rho V^2} = Tt \times \frac{K_L A}{W+T}$$

$$\therefore -\frac{M_W W}{\rho V^2} - \frac{M_W T}{\rho V^2} = TtK_L A$$

$$\therefore T\left(K_L At + \frac{M_W}{\rho V^2}\right) = -W. \frac{M_W}{\rho V^2} \quad (4$$

A, t, and W are constants, and values of K_L and $\frac{M}{\rho V}$ are known for the series of angles taken.

The tail load T required for equilibrium can therefore b calculated for every value of α, and using T in equation (3 the speed V appropriate to the angle is found. It will b noted that from the previous assumptions an upload on th tail is positive, and a download negative. It is also interest to work out the actual values of M_W in lbs. ft.

The slide rule work in the whole calculation will much facilitated by tabulation.

Having now obtained the complete pitching moments the machine without tail and the tail loads required balance these, we must consider the tail itself. A roug idea of the area required can be obtained by using th well-known rule for the "Tail Volume" or "u/U" Rati viz :—

$$\text{“Tail Volume” Ratio} = \frac{\text{Tail Area} \times \text{Distance of Tail from C.G.}}{\text{Wing Area} \times \text{Wing Chord.}}$$

$$= 0.3 \text{ to } 0.4.$$

The actual value chosen will depend on the type machine and the degree of stability required. A usef guide is obtained by finding the quantities for any simila machines of which particulars are available. Assumin then, that the tail area for investigation is chosen, w must find the tail plane lift coefficients appropriate to th tail loads calculated previously.

If a_t = tail area in sq. ft. $K_L{}^1$ = tail plane lift coefficien

E = tail plane efficiency,

Tail Load $T = E \times K_L{}^1 \rho a_t V^2$.

E is an empirical factor introduced to allow for the flo of air over the tail being disturbed by the fuselage an other obstructions. A reasonable value for a normal tract machine is 0.8 (gliding).

$$\therefore K_L{}^1 = \frac{T}{0.8\rho a_t V^2} \quad (5$$

We now require the angle of attack of the tail plane to th

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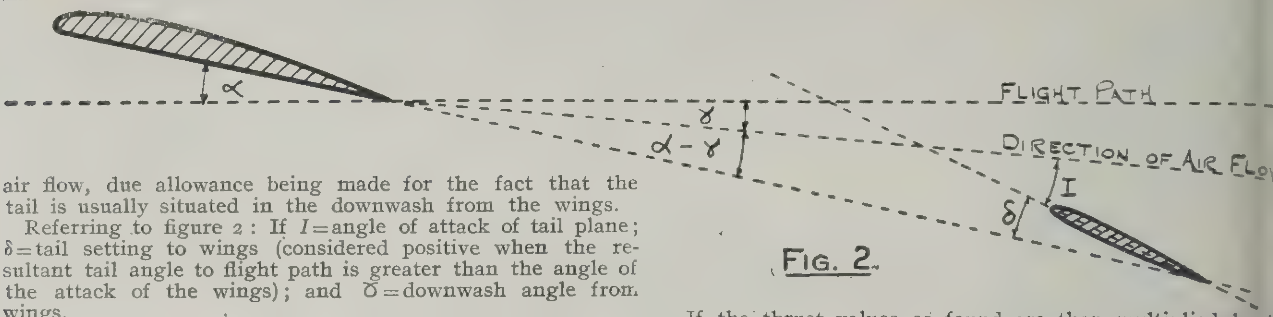


FIG. 2.

air flow, due allowance being made for the fact that the tail is usually situated in the downwash from the wings.

Referring to figure 2: If I=angle of attack of tail plane; δ=tail setting to wings (considered positive when the resultant tail angle to flight path is greater than the angle of the attack of the wings); and $\mho$=downwash angle from wings.

$$I=\alpha+\delta-\mho \qquad (6)$$

The downwash angle $\mho$ may be taken as $\frac{\alpha_1}{2}$ where α_1 is the angle of attack of the wings measured from the no-lift angle of the section.

The lift coefficient of a symmetrical tail plane can be expressed in the form

$$K_L{}^1=a_1I+a_2\eta$$

where I is the angle of attack of the tail plane and η is the elevator angle (positive when elevator is depressed), and a_1 and a_2 are constants depending on the shape of the tail and the proportions of the elevators.

For most practical purposes, 0.03 and 0.02 may be taken for a_1 and a_2 respectively, giving :—

$$K_L{}^1=0.03I+0.02\eta \qquad (7)$$

These values are based on the tail plane T.P.4 which is approximately rectangular, and has elevators of 40% tail plane chord, and may therefore be taken as reasonably typical of normal practice.

By means of equations (5), (6), and (7), we can now complete the calculations for the gliding case by working out $K_L{}^1$, I and η over the speed range for several different tail settings. The weathercock stability at any speed on a glide can then be deduced from the slopes of these curves, as stated previously.

Another interesting method of presentation is to calculate, for one tail setting, the actual tail loads which would be obtained if the elevator angle was fixed at zero. I is found from equation (6) as before, and $K_L{}^1$ from equation (7) (with $\eta=0$), the tail loads being given by equation (5), and if these loads are multiplied by t, the pitching moments of the tail with fixed elevators are obtained.

To these values of tail moment add the values of M_W found previously, plot the resulting moments on a base of α, and the slope of the curve obtained is in itself a criterion of the weathercock stability of the machine. For if the slope is positive at any point, it implies that the rate of change of machine moment M_W is less than the rate of change of tail moment M_T, and, as explained previously, the machine is stable at that point. Similarly, a negative slope indicates statical instability, and zero slope neutrality.

Having now completely investigated the statical stability of the machine in the gliding case, we must consider the conditions during flight at any attitude between stalling and top speed with the engine running at full throttle. Actually, all the moments acting round the C.G. of the machine are altered in magnitude by the slip-stream effect, but for simplicity this fact is neglected in certain cases. The wing moments, parasite drag moment, and body pitching moment are all assumed to be the same as in the gliding case, and for a normal machine the resulting error will be very small.

Hence the only difference between gliding and climbing, as far as the total machine moment M_W is concerned, will be the addition of a moment due to the thrust of the propeller.

(d) THRUST MOMENT.

At any attitude, the thrust moment about the C.G. of the machine will be given by Ff, where F is the propeller thrust in lbs., and f is the distance of the thrust axis from C.G. of the machine, in feet. If the thrust line is above the C.G., the moment Ff will be positive, and vice-versa.

Unless a detailed analysis of the propeller is available (which is very unlikely at this stage of the design), an empirical method must be used for the estimation of the thrust. Assuming that the maximum power and revolutions of the engine, and a reasonably correct value of the top speed of the machine, are known (these are fundamental design particulars), it is an easy matter to obtain an approximate value for the propeller diameter. The V/nD at top speed can then be found, and from this a good idea of the propeller efficiency is obtained, followed by the calculation of the thrust at top speed.

Then if F_L=Thrust at top speed and V_L=Top speed; the following empirical factors may be used to find the thrust F at any speed V :—

V/V_L	1.0	0.8	0.6	0.4	0.2	0
T/T_L	1.000	1.124	1.250	1.370	1.460	1.500

If the thrust values so found are then multiplied by f curve of thrust moment against speed is obtained. It of course, more accurate to find the thrust curve by actu analysis of the proposed airscrew, but the above empiri curve is quite good enough for a preliminary survey.

From the gliding case, we have a curve of comple machine moment M_W, and if the thrust moments at the a propriate speeds are added to this, the result will be curve of complete machine moment for the climbing ca The reader will notice that another approximation has be made, it having been assumed that the speed appropria to a given angle of attack in the case of gliding remai the same when climbing. This is obviously not the ca but the assumption is again justified by the simplificati obtained by its adoption.

Then from the equation :—

$$\text{Tail Moment } (Tt)+\text{Machine Moment } (M_W)=0$$

we can find the tail moments, and hence the tail load requir for equilibrium in the climbing case.

We have now to consider the tail plane characteristics wi the engine "all out." As stated previously, the lift efficient of the tail is given by :—

$$K_L{}^1 = \frac{T}{E\rho a_t V^2}$$

The efficiency E was taken as 0.8 in the gliding ca but is less when climbing due to the effect of the slipstrea The value for a normal tractor machine (in which the grea part of the tail is in the slipstream) may be taken as 0. with the engine "all out."

$$\text{Therefore } K_L{}^1 = \frac{T}{0.65\rho a_t V_1{}^2} \text{ during a climb.} \qquad ($$

The substitution of V_1 for V in the formula represents t effect of the slipstream on the tail. In the previous case, t velocity of the air over the tail was assumed equal to t forward speed of the machine V, but now a higher value V_1, must be taken, obtained by compounding the machi speed V and the slipstream speed $V+v$ in the proporti of tail area in slipstream to tail area outside slipstrea

This is obtained as follows :—Let n=proportion of tail ar in slipstream (it is sufficiently accurate to take the diame of the slipstream equal to the airscrew diameter, and a normal machine, n is usually found to be about 0.8), a let $V+v$=slipstream velocity.

A curve of $V+v$ against V may be obtained by using t formula :—

$$T/A_E=\rho v\ (V+1/3v)$$

Where T=thrust in lbs., A_E=effective airscrew area in ft., V=forward speed of machine in ft./sec., v=outfl velocity in ft./sec.

The effective propeller area may be taken as :—

$$A_E = \frac{\pi}{4}\left\{ D^2-\left(\frac{D}{3}\right)^2 \right\} \text{ (where } D\text{=propeller diameter)}$$

[Slipstream velocity charts calculated from the abc formula are to be found in several aeronautical publication

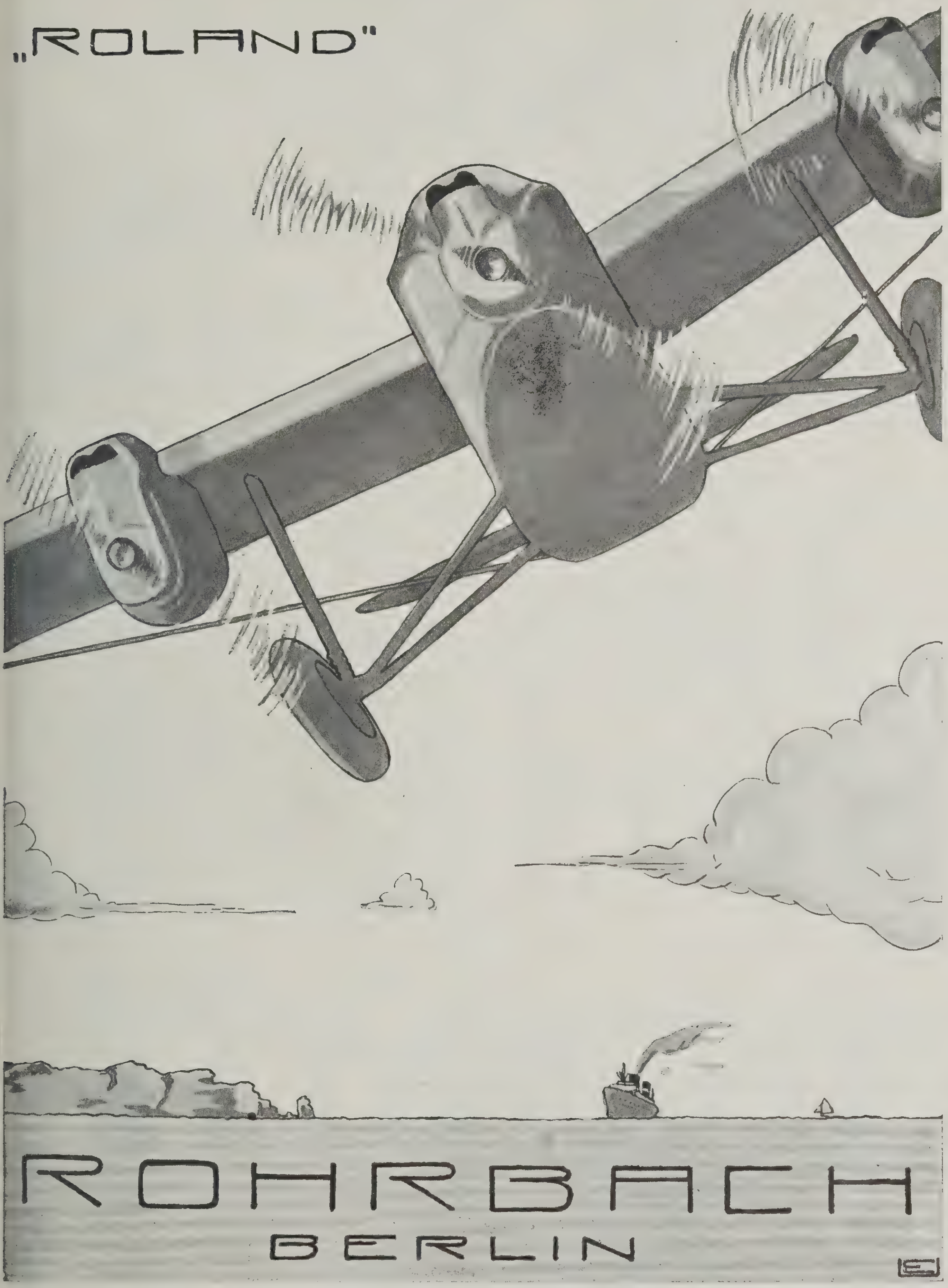
Then at any speed, the mean air velocity over the ta $V^1=n(V+v)+(1-n)V\ ft./sec.$

It is now possible to obtain the values of $K_L{}^1$ from equati (8) for all forward speeds, and the next problem is to find t angles of attack of the tail plane to the air flow, bearing mind the fact that in the "engine on" case, there is a dow wash due to the slipstream as well as the wing downwash

In order to avoid complication, it is assumed to be p sible to find the total downwash by treating the vari velocities vectorially. The results obtained will obviou not be very reliable, but will probably be of the right ord and with the scanty data available, it is difficult to what other method could be used to estimate this ter which is admittedly the most doubtful one in the wh investigation.

The directions of the air flow over the wings and tail in t slipstream can be easily derived from figure 3.

If α_0=angle between wings and thrust line,
α=angle of attack of wings to flight path,
V=forward speed of machine,
v=outflow velocity in slipstream,



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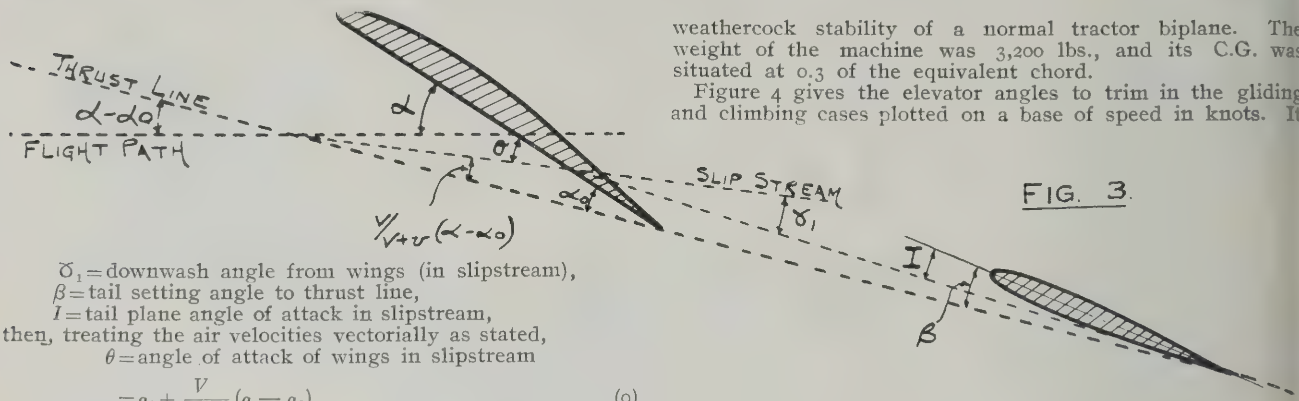

FIG. 3.

γ_1 = downwash angle from wings (in slipstream),
β = tail setting angle to thrust line,
I = tail plane angle of attack in slipstream,
then, treating the air velocities vectorially as stated,
θ = angle of attack of wings in slipstream

$$= \alpha_0 + \frac{V}{V+v}(\alpha - \alpha_0) \qquad (9)$$

γ_1, the downwash in the slipstream, is measured from the direction of the air flow on the wings, and is given, as before, by $\frac{\theta_1}{2}$, where θ_1 is the angle of attack in the slipstream measured from the no-lift angle of the section.

Then following the diagram, the angle of attack of the tail in the slipstream is found to be :—

$$I = \beta - \gamma_1 + \frac{V}{V+v}(\alpha - \alpha_0) \qquad (10)$$

Outside the slipstream, the tail plane angle of attack is $I = \alpha + \delta - \gamma$—(see equation (6)).

Therefore, the mean tail plane angle of attack is given by

$$I = n\left\{\beta - \gamma_1 + \frac{V}{V+v}(\alpha - \alpha_0)\right\} + (1 - n)\ (\alpha + \delta - \gamma) \qquad (11)$$

All these quantities are easily obtained, θ being calculated first, and then γ_1, followed by the tail plane angle in the slipstream, and as the conditions outside the slipstream are known from the "engine-off" calculations, the mean angle I is finally obtained.

The calculation is then completed by using equation (7) as in the case of gliding, the elevator angles being plotted on a speed base as before. The curve of machine moment + tail moment should also be plotted as in the gliding case.

We now have a complete set of curves showing the weathercock stability of the machine in the two extreme cases of gliding and climbing for a given C.G. position and tail area. Changes in C.G. position and tail area can now be investigated, and these quantities adjusted in order to give the desired stability.

As an example of the method, curves are shown in figures 4 and 5 giving results obtained from an investigation of the weathercock stability of a normal tractor biplane. The weight of the machine was 3,200 lbs., and its C.G. was situated at 0.3 of the equivalent chord.

Figure 4 gives the elevator angles to trim in the gliding and climbing cases plotted on a base of speed in knots. It will be noticed that the machine is statically stable throughout the speed range with the engine off, but when the engine is "all-out," statical instability occurs from about 75 knots to the top speed (100 knots). Figure 5 shows the same results, but the elevator angles are plotted on a base of angle of attack of the wings α.

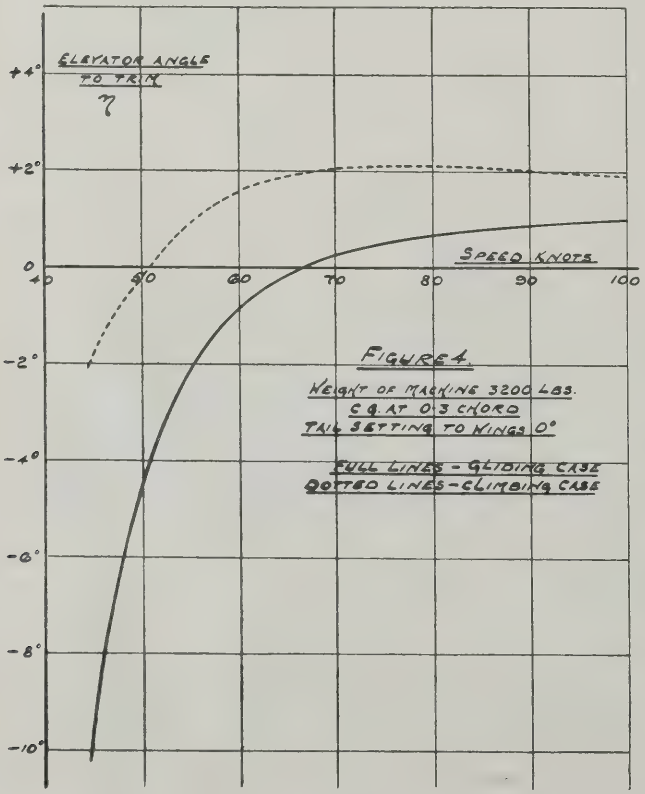

FIGURE 4.
WEIGHT OF MACHINE 3200 LBS.
C.G. AT 0.3 CHORD
TAIL SETTING TO WINGS 0°
FULL LINES – GLIDING CASE
DOTTED LINES – CLIMBING CASE

In the example chosen, the "Tail Volume Ratio" was 0.28, and to obtain weathercock stability over the complete speed range, the tail area would need to be increased. The curves also show that at any given speed, the elevators trim at a greater positive angle when the machine is climbing than when it is gliding. This means that if the engine suddenly "cuts out," the machine tends to depress its nose, which is a desirable feature at low speeds.

Another point worthy of note is that the curves, though giving no quantitative idea of the degree of the weathercock stability of the machine, may be used qualitatively to obtain a degree of stability on a new design similar to that of a known machine, for if any machine is known to possess stability characteristics particularly suitable for its type, similar characteristics may reasonably be expected on another machine of the same type, if the slopes of the elevator angle curves are the same in both cases.

In conclusion, it should be mentioned that the shortcomings of the method outlined in this article are admittedly numerous, particularly in the investigation of the downwash, but though the reader will undoubtedly find assumptions and factors that he will accept with reluctance, it must be remembered that the method is only to be regarded in the light of a simple, preliminary survey, and fulfils its object in that it gives an idea of the tail plane area and C.G. position required to give some degree of weathercock stability.

Although, strictly speaking, weathercock stability is not necessarily a criterion of dynamical stability, it is usually found that little trouble is experienced with machines which are statically stable, and results therefore justify the practice of making sure that the machine is stable as a weathercock.

The description given is essentially an outline. If more data is available and incorporated, and more refinements used, more accuracy will be obtained at the cost of greater complication, but even as it stands, a little experience in the use of the method will lead to quite valuable and interesting results.

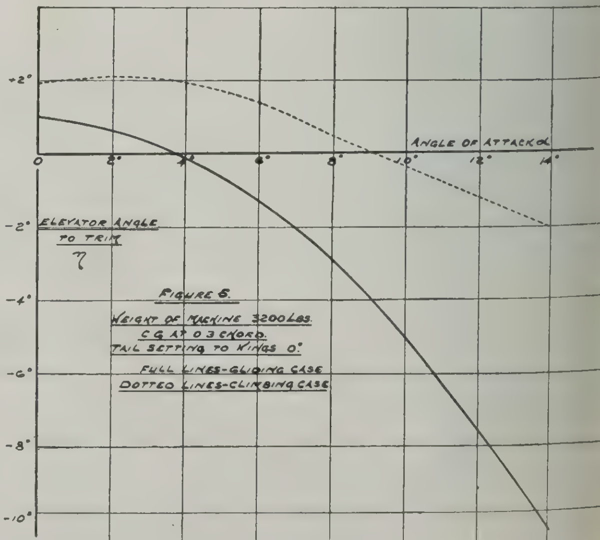

FIGURE 5.
WEIGHT OF MACHINE 3200 LBS.
C.G. AT 0.3 CHORD.
TAIL SETTING TO WINGS 0°
FULL LINES-GLIDING CASE
DOTTED LINES-CLIMBING CASE

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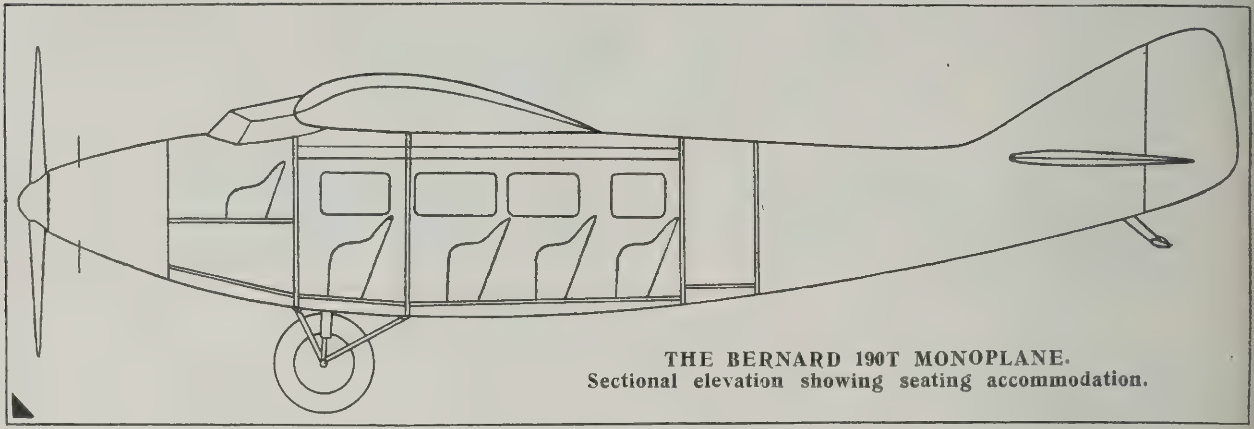


THE BERNARD 190T MONOPLANE.
Sectional elevation showing seating accommodation.

The Bernard 190T.

Made by The Societe des Avions Bernard, Rue Villot, La Corneuve, Seine. Eight passenger cabin monoplane.

Wings.—High wing cantilever monoplane. Wing built on three spars and covered with mahogany three-ply.

Fuselage.—Nearly rectangular section, timber framed and plywood covered.

Tail.—Fin and tail plane built into fuselage. Unbalanced control surfaces.

Undercarriage.—Split-axle type. A pair of Vees, one on each side, hinged to bottom of fuselage and carrying stub axles, are supported by telescopic legs running up to centre line of fuselage. Track 2.8 m. (9 ft. 2 in.).

Power Plant.—One Jupiter engine 420 h.p. Petrol tanks (2) in wing on each side of body with jettison valves.

Accommodation.—Two side-by-side seats with dual control in totally enclosed cockpit just ahead of leading edge. Cabin 3.9 m. (12 ft. 10 in.) long, 1.55 m. (5 ft. 1 in.) wide and 1.8 m. (5 ft. 11 in.) high below wing, fitted with eight seats. Baggage locker below pilot's seat, lavatory at rear of cabin.

Dimensions.—Span 17.3 m. (56 ft. 8 in.), Length 12.5 m. (41 ft. 0 in.), Height 3.5 m. (11 ft. 6 in.), Wing area 42.909 m. (461 sq. ft.).

Weights and Loadings.—Weight empty 1,780 kg. (3,916 lbs.), Pilot 80 kg. (176 lbs.), Fuel 440 kg (968 lbs.), Pay load 1,000 kg. (2,200 lbs.), Weight loaded 3,300 kg. (7,260 lbs.), Wing loading 77 kg./sq. m. (15.7 lbs./sq. ft.), Power loading 7.9 kg./h.p. (17.3 lbs./h.p.).

Performance.—Maximum speed 220 km.h. (137 m.p.h.), Minimum speed 90 km.h. (56 m.p.h.), Climb to 1,000 m. (3,280 ft.) 7 mins., to 3,000 m. (9,840 ft.) 29½ mins., Range at 200 km./h. (124 m.p.h.) 1,000 km. (620 miles).

The Breguet 280T

Made by The Societe Anonyme des Ateliers d'Aviation Louis Breguet, Rue de la Pompe, 115, Paris. Eight passenger transport machine, derived from the Breguet type XIX.

Wings.—Unequal winged biplane, lower wing of reduced span and chord. One outwardly raking strut between wings, with main left bracing from joint of this strut and lower wing to undercarriage axle. Wing structure of duralumin fabric covered. Unbalanced ailerons on top wing only.

Fuselage.—Framing of duralumin tubes with swaged wire bracing. Front of fuselage duralumin covered.

Tail.—Adjustable tail plane, nearly triangular and large balanced elevators. Triangular fin and unbalanced rudder.

Undercarriage.—Cross-axle type. Axle rigidly fixed to two built-up duralumin legs attached on each side of the fuselage. The wheels are carried on horn-blocks supported by the axles and contain shock absorbers inside the wheel frames. The main lift wires are attached to the axle ends outside the wheels.

Power Plant.—Any engine of 420 to 500 h.p. may be fitted. Engines so far arranged for are the 500 h.p. Renault (geared), the 450 h.p. Lorraine-Dietrich (geared), and the Jupiter (geared or ungeared).

Fuel.—(640 litres = 141 galls.) carried in tanks below the cabin floor which may be dropped in emergency.

Accommodation.—Two seats side-by-side for pilot and navigator ahead of leading edge of upper wing in an enclosed cockpit. Behind is a cabin 4.23 m. (13 ft. 11 in.) long, 1.85 m. (6 ft. 1 in.) wide, and 1.80 m. (5 ft. 11 in.) high fitted with eight chairs and two folding seats. Behind the cabin is a lavatory and a large baggage space. There is a further baggage space below pilot's seat.

Dimensions.—Span 17.25 m. (56 ft. 8 in.), Length 12.125 m. (39 ft. 10 in.), Height 4.08 m. (13 ft. 5 in.), Wing area 55.85 sq. m. (600 sq. ft.).

Weights and Loadings (with 500 h.p. Renault engine).—Weight empty 1,607 kg. (3,535 lbs.), Fuel 350 kg. (770 lbs.), Oil 48 kg. (106 lbs.), Pilot 80 kg. (176 lbs.), Pay load 1,015 kg. (2,233 lbs.), Loaded weight 3,100 kg. (6,820 lbs.), Wing loading 55.5 kg./sq. m. (11.4 lbs./sq. ft.), Power loading 6.2 kg./h.p. (13.4 lbs./h.p.).

Performance.—Maximum speed 200 km./h. (124 m.p.h.), Minimum speed 90 km./h. (56 m.p.h.), Climb to 1,000 m. (3,280 ft.) 6 mins., to 3,000 m. (9,840 ft.) 29 mins.

The Farman 180.

Made by The Societe des Avions H. and M. Farman, 167, Rue de Silly, Billancourt (Seine). Twin-engined long-range passenger carrier. Derived from Transatlantic "Oiseau Bleu" type.

Wings.—Two bay biplane with over-hang on top plane. Normal timber structure. Ailerons on top wing.

Fuselage.—Oval section, built on a number of shaped frames tied by light longitudinals and covered within and without with plywood.

Undercarriage.—Cross-axle Vee type.

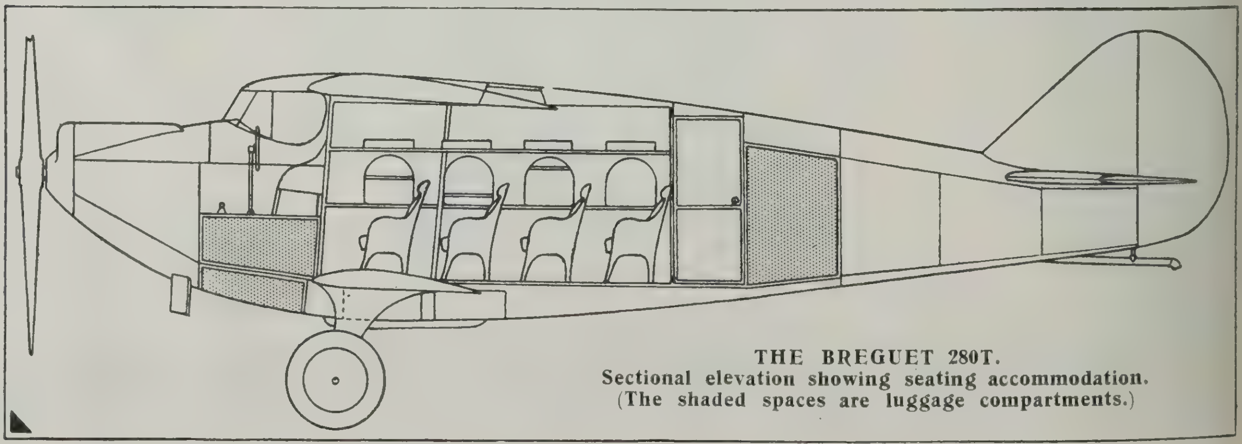
Tail.—Tail plane, fin and rudder all rectangular. Horn balances to elevators.

Power Plant.—Two 500 h.p. Farman engines in tandem mounted on top wing.

Accommodation.—Crew of two in totally-enclosed cockpit in extreme bow of fuselage. Behind this is a cabin 8.0 m. (26 ft. 3 in.) long, 2.35 m. (7 ft. 8 in.) wide, and 1.80 m. (5 ft. 11 in.) high. This may be equipped for 25 passengers for 500 km. (300 mile) stages, for 17 passengers or for 12 sleeping berths for 1,000 km. (600 mile) stages. In addition there is 5 cub. metres (175 cub. ft.) of baggage space.

Dimensions.—Span 26.0 m. (85 ft. 6 in.), Length 18.0 m. (59 ft. 0 in.), Height 5.8 m. (19 ft. 1 in.), Wing area 172 sq. m. (1,860 sq. ft.).

Weights and Loadings.—Weight empty 4,500 kg. (9,900 lbs.), Fuel and oil (for 1,000 km. = 620 miles) 1,300 kg. (2,860 lbs.), Disposable load 2,000 kg. (4,400 lbs.), Weight fully loaded 7,800 kg. (17,160 lbs.), Wing loading 45.4 kg./sq. m. (9.24 lbs./sq. ft.), Power loading 7.8 kg./h.p. (17.2 lbs./h.p.).



THE BREGUET 280T.
Sectional elevation showing seating accommodation.
(The shaded spaces are luggage compartments.)

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The Levasseur Torpedo Carrier.

Made by P. Levasseur, 17, Place Felix Faure, Paris. Two-seater long-range torpedo carrier derived from the Levasseur *type Marin* three-seat naval reconnaissance machine.

Wings.—Unequal winged biplane, lower wing of reduced chord and span. Both wings in three sections. Top centre section carried on W struts from fuselage, bottom centre section built into fuselage well above bottom. One pair of raking interplane struts per side. To reduce the space needed for stowage the overhanging sections of the top wing may be folded.

Fuselage.—Wooden framed and wooden skinned with "tumble-home" sides and a Vee bottom. For emergency alightings at sea the undercarriage may be dropped and the fuselage serves as a float.

Tail Unit.—No data.

Undercarriage.—Split-axle type with compression rubber shock absorbers. May be released for alighting on water. An alternative float undercarriage may be substituted for the land undercarriage.

Power Plant.—One 550 h.p. Farman or one 580 h.p. (geared) Renault.

Accommodation.—Two open cockpits in tandem. Front one with synchronised machine-gun. Gear for slinging a torpedo—or one 410 kg. (900 lb.) bomb—below fuselage and normal bomb racks under lower wing.

Dimensions.—Span (top) 18 m. (59 ft. 2 in.), Span (bottom) 13.6 m. (44 ft. 8 in.), Span with extensions folded 14.2 m. (46 ft. 7 in.), Length 11.68 m. (38 ft. 4 in.), Height 4.9 m. (16 ft. 1 in.), Wing area 77.5 sq. m. (830 sq. ft.).

Weights and Loadings.—Weight fully loaded 3,650 kg. (8,025 lbs.), Disposable load 1,000 kg. (2,200 lbs.), (No data as to what is included in disposable load, but fuel, oil, and crew are usually so classed in France.) Wing loading 47.1 kg./sq. m. (9.7 lbs./sq. ft.), Power loading (550 h.p.) 6.65 kg./h.p. (14.5 lbs./h.p.).

Performance.—No data available pending completion of tests. Endurance 5 hours.

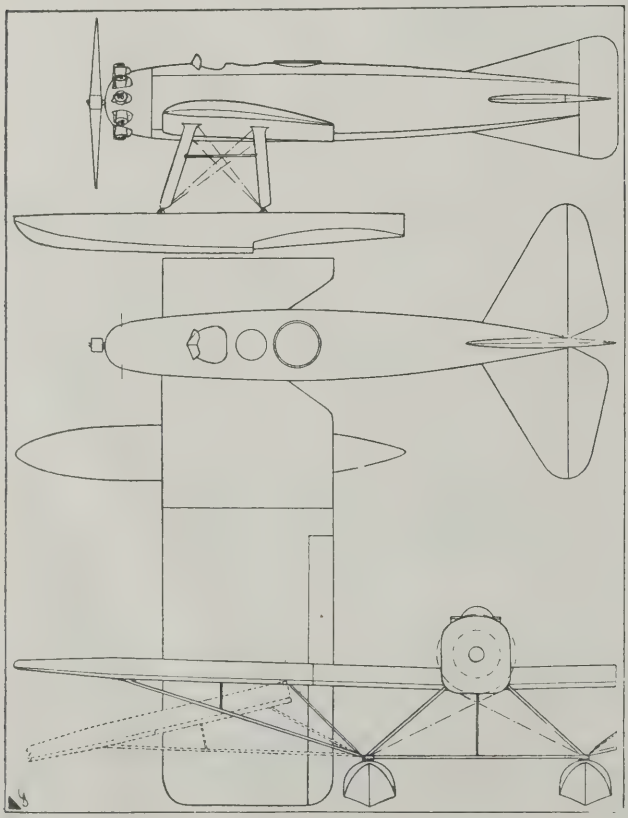
The Loire-Gourdou-Leseurre, Type L.2.

Made by Ateliers et Chantiers de la Loire, 4, Rue de Téhéran, Paris. Two-seater seaplane for use from aircraft-carrier ships.

Wings.—Low-wing, strut braced monoplane. Wings of normal timber structure. Wings in three sections—one built into fuselage. Outer sections are supported each by two pairs of struts running down to the floats. By detaching the outer-section spar-joints the outer sections can be lowered onto the deck pivoting about the lower ends of the struts, and rapidly detached for stowage. Ailerons which also serve as camber-changing flaps are fitted.

Fuselage.—Rectangular section, steel tube framing, fabric covered.

Tail Unit.—Tail plane triangular with rounded tips. Unbalanced elevators. Equal triangular fins above and below fuselage.



Undercarriage.—Two long single-step Vee-bottomed floats entirely of wood supported by two steel tube struts per side and coupled by cross-axles. Floats may be replaced by skis.

Power Plant.—One Jupiter engine, 420 h.p., driving airscrew direct. Two petrol tanks with jettison valves, one on each side in central wing section.

Accommodation.—Tandem open cockpits, front one for pilot, behind front wing spar, rear one just ahead of trailing edge. Twin synchronised machine-guns controlled from front seat. Rear cockpit has Scarff ring mount for Lewis guns, and a bottom gun position for fire below the tail.

Dimensions.—Span 16.0 m. (52 ft. 6 in.), Length 10.5 m. (34 ft. 6 in.), Height 3.5 m. (11 ft. 6 in.), Wing area 43 sq. m. (462 sq. ft.).

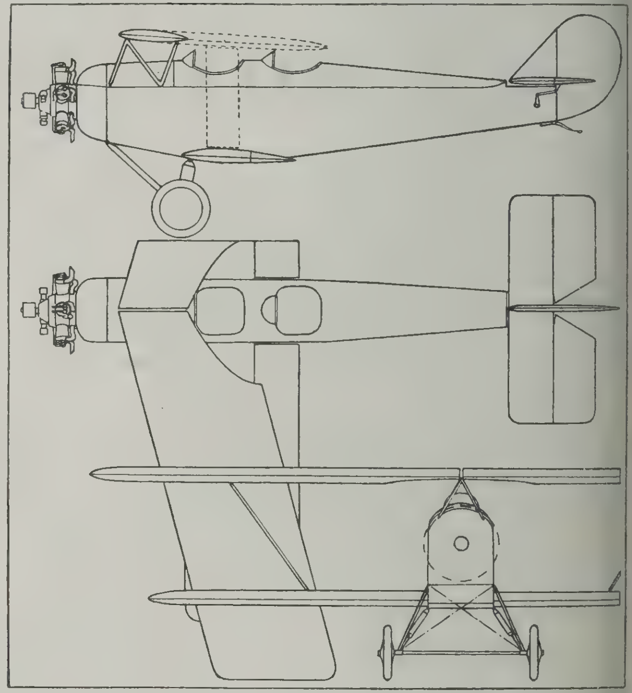
Weights and Loadings.—Weight empty 1,520 kg. (3,344 lbs.), Crew (2) 160 kg. (352 lbs.), Fuel and oil 320 kg. (704 lbs.), Armament 190 kg. (418 lbs.), Wireless or photographic equipment 80 kg. (176 lbs.), Sundries 20 kg. (44 lbs.), Loaded weight 2,290 kg. (5,038 lbs.), Wing loading 53 kg./sq. m. (10.8 lbs./sq. ft.), Power loading 5.45 kg./h.p. (12 lbs./h.p.).

Performance.—Maximum speed 185 km.h. (115 m.p.h.), Minimum speed 89 km.h. (55 m.p.h.), Climb to 1,000 m. (3,280 ft.) 4 mins. 12 secs., to 3,000 m. (9,840 ft.) 15 mins. 47 secs., Service ceiling 5,300 m. (17,400 ft.), Time to take off 14 secs.

The Parnall Imp.

Made by George Parnall and Co., Coliseum Works, Bristol. Two-seater light aeroplane.

Wings.—Cantilever biplane. Wings built on light vertical spruce members taking shear stresses with a spruce veneer covering carrying main bending stresses. Spruce covering tapered in thickness and spacing of transverse former ribs graded along span in accordance with stress distribution. The upper wing has a marked sweep back and is in two sections, pin jointed to a cabane on centre line of machine.



Two raking spruce members serve as lift or landing wires and transmit lift, etc., loads to halfway along span of lower wing. Lower wing is in one piece continuous across fuselage and takes flying and landing loads in bending. The lower wing has no sweep-back and is fitted with ailerons running up to the side of the fuselage, where they are directly connected by a link to control levers projecting from the sides of the fuselage.

The interplane struts have quickly-releasable attachments to the lower wing and when released fold up to lower surface of top wing, which may then be released from the cabane and removed bodily from the machine. After disconnecting the aileron control links and a locking device the lower wing can be pressed backwards and dropped from the fuselage. Complete removal of wings takes two men two minutes.

Fuselage.—Rectangular section with domed top, built on four spruce longerons and three-ply covered. At the front end the three-ply skin is reinforced by a triangulated strut system between longerons, aft of the cockpit there are only light vertical formers and the skin serves as sole bracing.

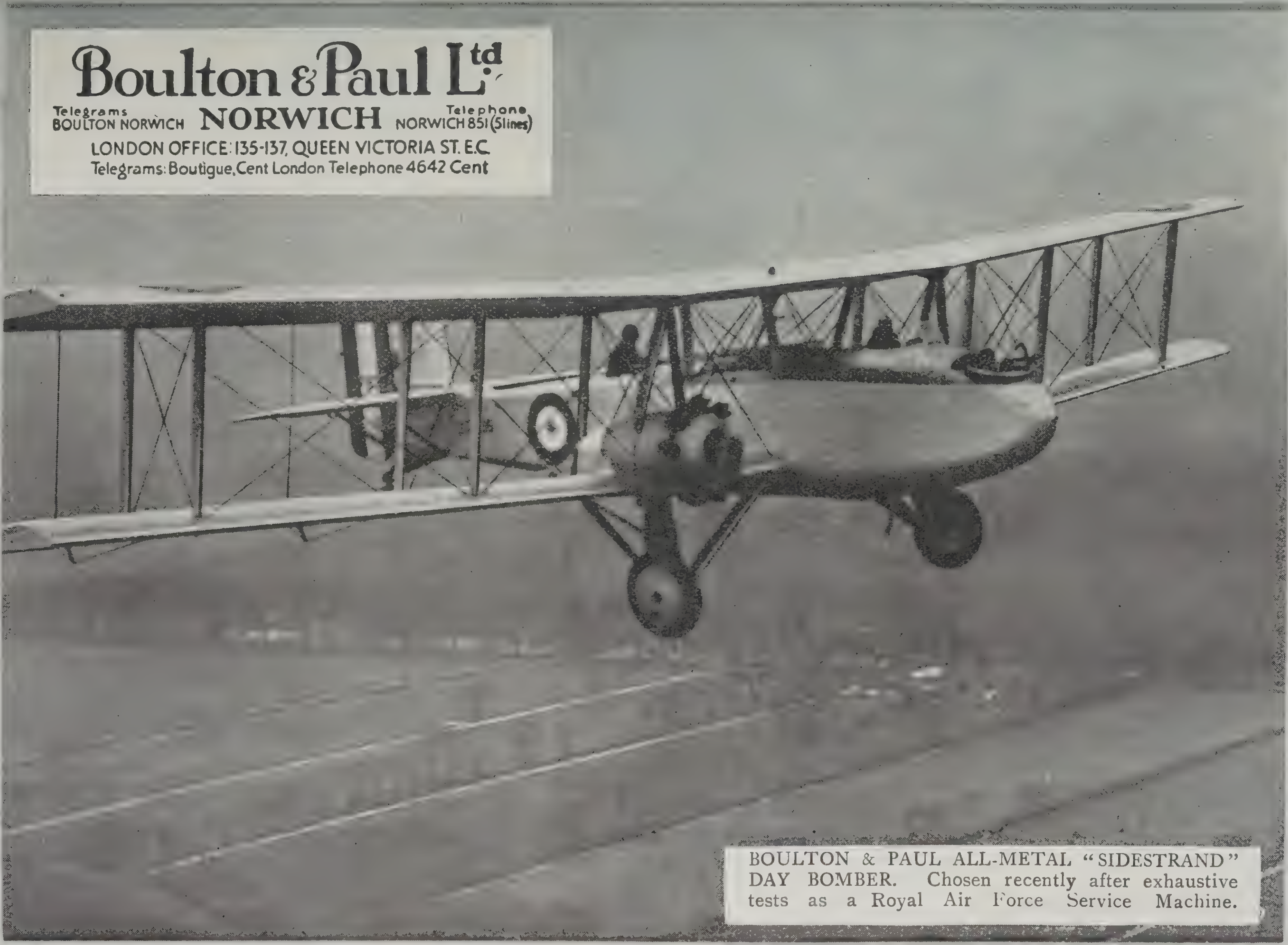
Tail Unit.—Normal in form, devoid of external bracing and similar in construction to wing surfaces

Undercarriage.—Cross-axle Vee type with spiral spring and oleo buffer in rear leg of each Vee. Laminated spring tail-skid.

Power Plant.—One Armstrong-Siddeley Genet air-cooled radial engine (65 h.p.). Gravity petrol tank in top fairing of fuselage ahead of front cockpit.

Accommodation.—Two open tandem cockpits with dual control (removable from front seat). Both seats are behind the central portion of the upper wing which is level with the eyes of both occupants and presents a minimum of obstruction to view. The front cockpit is over the leading, and the rear cockpit over the trailing, edge of lower wing and both occupants have an abnormally good view. Both cockpits are unusually roomy for a machine of this size. Two roomy lockers for baggage—one ahead of and one aft of the cockpits—are fitted.

Dimensions.—Span (top) 25 ft. 6 in. (7.77 m.), (bottom) 21 ft. 6 in. (6.52 m.), Chord (top and bottom) 4 ft. 0 in. (1.22 m.), Length



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Weights and Loadings.—Weight empty 850 lbs. (386 kg.), Weight loaded (normal) 1,320 lbs. (600 kg.), Wing loading 7.5 lbs./sq. ft. (39 kg./sq. m.), Power loading 20.3 lbs./h.p. (9.25 kg./h.p.).

Performance.—Maximum speed 102 m.p.h. (164 km.h.), Landing speed 40 m.p.h. (64 km.h.).

The Potez 29.

Made by Aeroplanes Henry Potez, 14, Rue de Marignan, Paris. Civil passenger carrier or ambulance machine derived from the Potez 25 reconnaissance and bombing machine.

Wings.—Unequal winged biplane. Lower wing smaller in chord and span than upper. One pair of raking interplane struts per side. Unbalanced ailerons on top wings only. Normal wooden structure.

Fuselage.—Rectangular section, timber framed and plywood covered.

Tail Unit.—Triangular tail plane, adjustable in the air, with horn-balanced elevators. Very small fin and large balanced rudder. Timber framed.

Undercarriage.—Cross-axle Vee type. Axle divided and hinged on centre line to an inverted V

Power Plant.—One 450 h.p. Lorraine-Dietrich engine.

Accommodation.—Two side-by-side seats below leading edge of top wing for crew, totally enclosed. Cabin behind accommodates three stretchers and an attendant for ambulance service. As a commercial machine six seats are provided for passengers.

Dimensions.—Span 14.5 m. (46 ft. 6 in.), Length 10.7 m. (35 ft. 2 in.), Wing area 4,809 m. (535 sq. ft.).

Weights and Loadings.—Weight empty 1,400 kg. (3,080 lbs.), Weight loaded 2,400 kg. (5,280 lbs.), Wing loading 50 kg./sq. m. (9.9 lbs./sq. ft.), Power loading 5.35 kg./h.p. (11.7 lbs./h.p.).

Performance.—Maximum speed 205 km.h. (127 m.p.h.).

The Romano Seaplane Type R.4.

Made by Chantiers de la Croisette, Cannes, A.M., France. Two-seater float seaplane for use from aircraft-carrier ships. Designed to be catapult-launched if necessary.

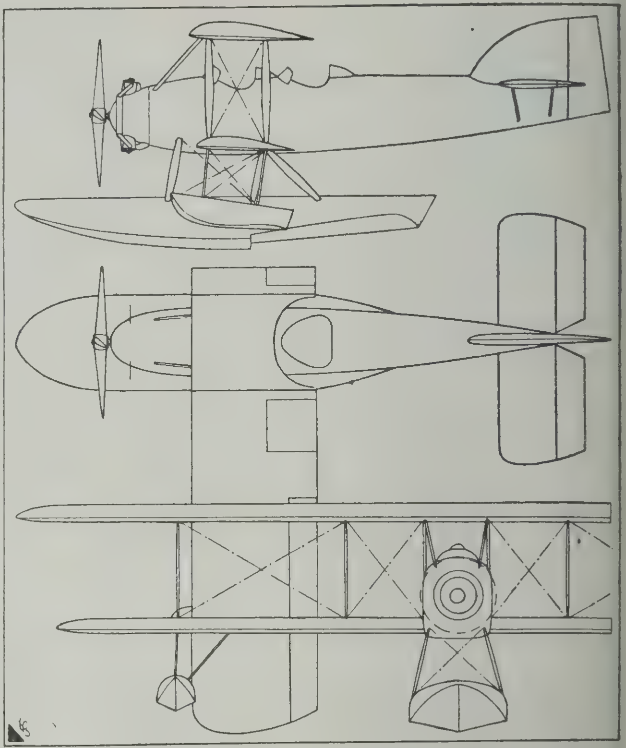
Wings.—Unequal biplane. Lower wing of slightly less span and considerably less chord than upper wing. Two pairs of interplane struts per side with normal streamline wire cross-bracing. Ailerons on top wing only. Wings fold at inner interplane struts. Normal timber structure.

Fuselage.—Rectangular section timber frame.

Tail Unit.—Normal type, timber structure. Tail plane strut braced on under side only. Tail trimming gear apparently not fitted. Control surfaces unbalanced.

Undercarriage.—One central float of very wide beam, having a single step and slight Vee bottom. Two wing-tip floats. Main float supported on six (three per side) struts. One of these running back from below bottom rear wing spar is evidently intended to take catapult thrust.

Power Plant.—One Salmson A.B.9 air-cooled radial engine of 230 h.p driving four-bladed airscrew.



Accommodation.—Two open cockpits in tandem, one below centre section, one in line with trailing edge of upper wing. No information available as to accommodation for service equipment.

Dimensions.—Span (top) 11.4 m. (37 ft. 3 in.), (bottom) 10.4 m. (34 ft. 0 in.), Span, wings folded, 5.6 m. (18 ft. 4 in.), Length 8.58 m. (28 ft. 1 in.), Height 3.2 m. (10 ft. 5 in.), Wing area 32 sq. m. (343 sq. ft.).

Weights and Loadings.—Weight empty 1,045 kg. (2,300 lbs.), Weight loaded 1,445 kg. (3,180 lbs.), Wing loading 45.2 kg./sq. m. (9.3 lbs./sq. ft.), Power loading 6.28 kg./h.p. (13.8 lbs./h.p.).

Performance.—Maximum speed 177 km.h. (110 m.p.h.), Minimum speed 8.5 km.h. (53 m.p.h.), Speed at 2,000 m. (6,560 ft.) 168 km.h. (104 m.p.h.), Climb to 3,000 m. (9,840 ft.) 22 mins., Time to take off 11 secs

TECHNICAL ABSTRACTS.

Aero-Engines.

"Air-cooled Radial Engines." By R. W. A. Brewer, A.M.I.C.E., F.S.E., M.I.A.E. Paper read before the Society of Engineers on April 2.

This extensive paper consists essentially of two parts. The first is a general review of the past history and present position of the air-cooled radial type of engine generally, together with a statement of the advantages of the type. The present author's claims for the type generally do not differ from those which have previously been made and substantiated, though he adds one which has not previously been given due prominence. This is that the air-cooled radial, thanks to the almost complete absence of inertia torque and to the relative stiffness of its crankshaft, does not suffer from resonant torsion of the crankshaft and consequently may be fitted with reduction gears with less difficulty than other types.

In the second section the author disusses the design of air-cooled radial engines for commercial use. Mr. Brewer has for some time past been engaged in the development, in America, of such engines of moderate power and designed to be sold at a moderate price for service in other than military machines. The problems he has thus faced differ in some important respects from those which face the designer of engines intended primarily for military aircraft.

Cost of manufacture, cheapness of maintenance and repair become of greater importance than in military service, and in general it is advisable not to seek for the development of maximum M.E.P. for civil purposes if cost is thereby unduly increased.

In the engines designed by the author cast-iron cylinders have been used in place of the more usual type of machined steel forgings with light alloy heads, and a number of other concessions are made to the need for low cost, with little ill-effects on the weight or performance.

The paper discusses in considerable detail the practical design problems involved in this type of engine, including the design of crankshaft and big-end, the effect of the spacing of auxiliary rod-centres round the big-end on piston travel, balancing problems, the design of valve-gear, of induction system and the like, and gives a number of interesting test results.

An appendix gives a set of calculations for the design of a fan distributor for a seven-cylinder engine.

Aerodrome Lighting.

L'Allumage automatique des phares par le son des Avions. "L'Aeronautique," February, 1928.

Reports that the Westinghouse Company of Pittsburgh, Pa., have developed an acoustic apparatus which when excited by the note of an aeroplane engine for a continuous period of at least ten seconds causes landing, etc., lights on an aerodrome to light up. No details of the apparatus.

Meteorology.

"Fog." (Paper by F. Entwhisle, B.Sc., read before Royal Aeronautical Society, Dec. 8, 1927.)

Fog may be formed :—(1) by the mixing of two streams of air of different temperatures, neither of them saturated, but causing a saturated mixture, or (2) by the cooling of unsaturated air to below the dew-point from contact with chilled earth or sea. In either case turbulence of the air is necessary otherwise the condensed water particles are deposited as dew.

Conditions most favourable to fog are a stable stratified state of the air with an inverted temperature gradient low down, and a surface chilled to below the air temperature. Conditions leading to water fog also favour smoke fog, as stratification prevents smoke particles from being carried upwards.

Though formation of fog is governed by meteorological conditions, local topography greatly affects probability of fogs at a given place. Different localities are subject to fogs of different origin, and therefore the forecasting of fogs is difficult. Fogs caused by radiation from the ground, and chilling of air in contact with the cooled earth, can be forecast with fair accuracy at inland stations from the readings of wet and dry bulb thermometers under conditions which depend on the local characteristics of those stations.

Forecasts of visibility, including probability of fog, are given in all aviation weather forecasts issued by the Air Ministry. Also all weather reports for civil aviation give actual visibility at these stations. Such stations issue in addition to routine reports, special reports whenever visibility (a) is decreasing and has become less than 1,000 metres, (b) is decreasing still further and has fallen below 200 metres, and (c) having fallen below 200 metres, is increasing and has remained above 200 metres for at least 10 minutes.

Fog dissipation by artificial means is impracticable on account of the great energy expenditure. Penetration of fog by the use of light of special wave-length may be useful. The problem is one of optics, and there is little data available. Smoke fogs and water fogs need different wave-lengths.

Smoke particles are much smaller than the water particles of fog. Smoke scatters only short wave-lengths, water scatters all visible wave-lengths. Red light—as from the Neon beacon—has fair penetration in a smoke-fog, but no special virtue in a water-fog. Infra-red

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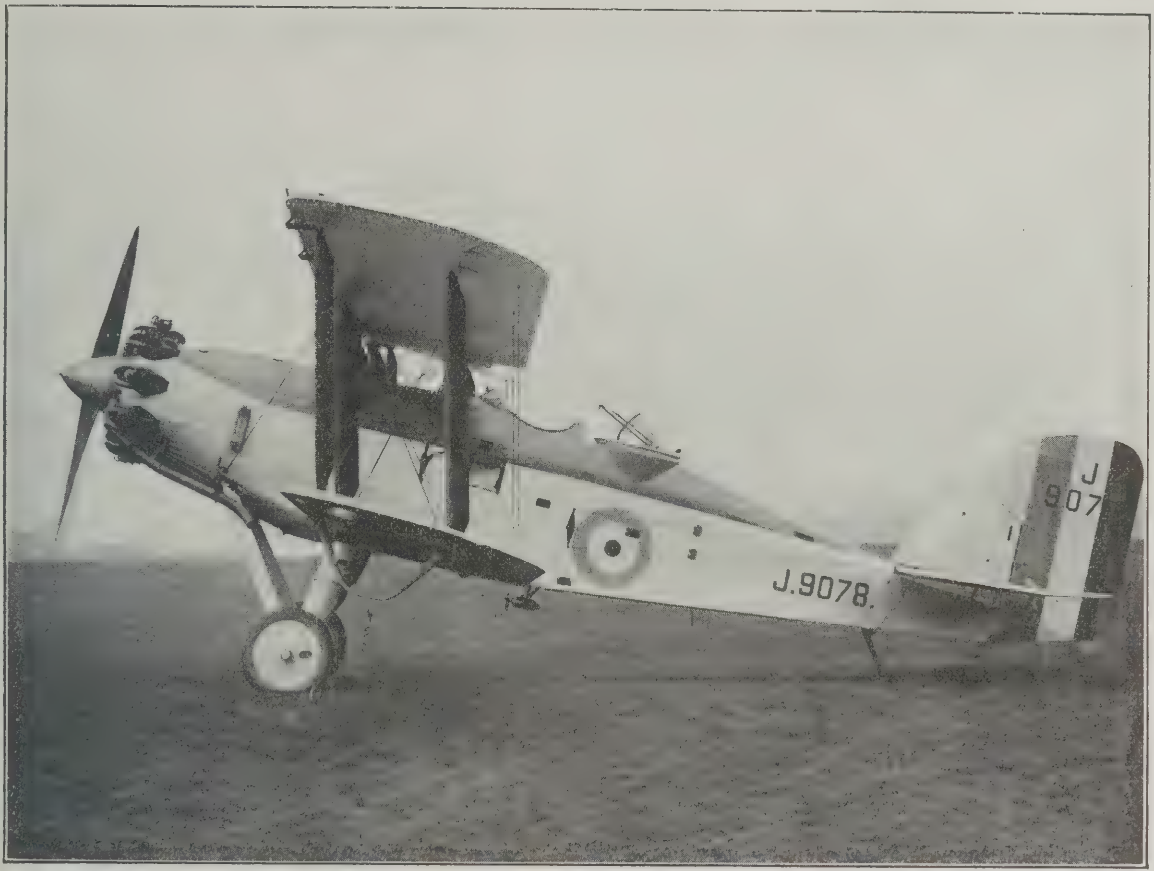

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rays have been suggested for fog-piercing purposes. Such rays will penetrate smoke-fog, their value in water-fog is questionable. Apart from this is the problem of a suitable generator for such rays, and a receiving instrument which will make them visible.

The paper contains a good deal of interesting statistical data as to the frequency of fog at various stations, etc.

Russian Load Factors for Aircraft.

Calculs de Resistance des Avions et Essais Statiques en Russie. "L'Aeronautique," February, 1928.

An account of the regulations drawn up by the Central Aero-Hydro-Dynamic Institute, Moscow, for the strength of both civil and military aircraft in Russia. The final check on the strength of any given type of machine is apparently that of loading to failure under specified conditions, but designers are apparently required to submit calculations of failing loads in the first instance. Load factors are specified for the following conditions:—

Wings.—(A) C.P. in maximum forward position, (B) C.P. at 2/3 chord behind leading edge, (C) dive at limiting speed, (D) inverted flight C.P. at .25 chord.

Tail.—Horizontal surfaces: (E) Equilibrium conditions in nose dive, (F) an arbitrary loading based on twice the loading at landing speed at a specified force coefficient of 0.4 (0.2 British units). Vertical surfaces on same condition as (F) for horizontal surfaces.

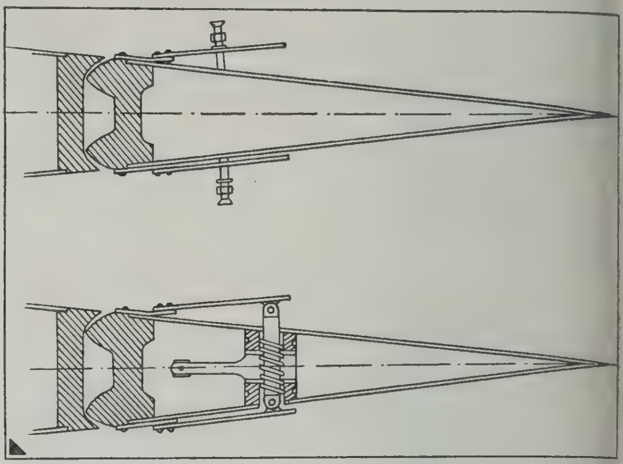
Fuselage.—(G) Landing when a factor is required = 2 + (landing speed km.h. :—20), (H) for nose dive load on tail, and (I) for horizontal load as above on fin rudder.

Civil aircraft are divided into four categories according to weight: (1) up to 2,500 kg., (2) up to 5,000 kg., (3) up to 10,000 kg., and (4) over 10,000 kg., with load factors decreasing with increasing weight. The factors for the smallest class (not exceeding 2,500 kg.) are 5.5 C.P. forward, 4 C.P. back, and 1.25 for nose dive conditions and fall to 4, 3, and 1.25 for the largest class. Thus these requirements conform very closely to present British standards.

Military aircraft are classified by types and very high load factors are required from high performance machines. Single-seat land fighters require factors of 12 and 7 C.P.F. and C.P.B., two-seat fighters 10 and 6, reconnaissance machines 8 and 5, and torpedo carriers and light bombers 6 and 4. Heavy bombers requirements are similar to those for commercial machines of equal weight.

Trimming Gear for Control Surfaces.

Les Compensateurs d'Empennage Nieuport-Delage. "L'Aeronautique," March, 1928



THE NIEUPORT-DELAGE TAIL TRIMMING FLAPS.—The top view shows a form adjustable only on the ground. That at the bottom may be controlled in the air through cables running to the lever inside the elevator.

La Société Nieuport-Astra have recently adopted a device for trimming control surfaces—in particular elevators—which it is claimed makes the usual type of adjustable tail-plane unnecessary. This consists of a pair of narrow-hinged flaps lying along the leading edge of the elevators and—in their neutral position—flat on top and bottom faces of these surfaces.

Raising one of these flaps disturbs the flow over that side of the surface and causes an air force towards the side of the raised flap. In this way the no-lift angle of the tail and elevator in any position of elevators may be altered in the direction necessary to trim the machine.

These flaps may be either adjustable from the ground only, or may be operated by the pilot in the air.

NEW TECHNICAL LITERATURE.

Aeronautical Research Committee.

R. & M. 1061.—*"The Distribution of Normal Pressures on a Prolate Spheroid." By R. Jones, M.A., D.Sc. Price 3s. net.*

Comparison between the theoretical pressures in an inviscid fluid and those measured in air on a spheroid, (1) in rectilinear motion at various angles of yaw, (2) spheroid spinning, and (3) spheroid moving in a circular path. Agreement between theoretical and measured pressures is good for (1) except at aft end of body, fair for (2) except at both ends, and good for (3). The agreement improves as the speed of model test increases. Results should be valuable for airship design.

R. & M. 1081.—*"The Flexure of Thin Cylindrical Shells and other 'Thin' Sections." By L. G. Brazier, B.Sc., A.C.G.I. Price 1s. net.*

Theoretical investigation of the failure of thin metal tubes and similar members under load as a result of elastic instability. Suggests that modifications of the methods of design now used for metal spars would lead to more efficient members.

R. and M. 1096.—*"Full-scale Measurements of Lift and Drag of the Fokker F.VII-3M Monoplane." By J. K. Hardy, B.A. Price 6d. net.*

Report of full-scale tests at Farnborough.

R. & M. 1097.—*"The Flow of Air and of an Inviscid Fluid Round an Elliptic Cylinder and an Aerofoil of Infinite Span, Especially in the Region of the Forward Stagnation Point." By A. Fage, A.R.C.S. Price 1s. net.*

Record of experiments showing marked differences between the theoretical and the real position of the stagnation point at the nose of an aerofoil.

R. & M. 1098.—*"The Distribution of Pressure over a Monoplane and Biplane with Wings of Unequal Chord and Equal Span." By A. S. Batson, B.Sc., A. S. Halliday, B.Sc., and A. L. Maidens. Price 1s. 3d. net.*

Wind-tunnel tests of pressure distribution over a R.A.F.15 mono plane and also over a R.A.F.15 biplane with lower plane 2/3 chord of upper and 20° stagger. Results of interest for strength calculations.

R. & M. 1100.—*"Wind Tunnel Experiments on the Effect on the Maximum lift of Withdrawing and Discharging Air from the Upper Surface of an Aerofoil." By W. G. A. Perring, R.N.C., A.M.I.N.A., and G. P. Douglas, M.C., D.Sc. Price 6d. net.*

The increase of maximum lift of an aerofoil caused by the Handley Page slot is due to the blowing away of the stagnant air in the boundary layer on the upper surface of the aerofoil. The same effect can be produced by creating a blast of air at the place where the slot opens to the upper surface, or by sucking air into a slot in the same position. The present report shows that the same quantity of air, whether sucked in or blown out, produces practically the same increase of maximum lift. The effect produced depends mainly on the quantity of air sucked in or blown out, and to a slight extent on the velocity of the air through the slots. Data are given showing the quantity of air which must be discharged or withdrawn for a given effect.

R. & M. 1072.—*"The Characteristics of Certain Aerofoil Sections for Infinite Aspect Ratio. By A. S. Hartshorn, B.S.C. Price 9d. net.*

Profile drag, lift and pitching moment characteristics of R.A.F.15, 25, 26, 27, 28, 30, 31, 32, 33, 34, and M.2.

R. & M. 1102.—*"The Undercooling of Some Aluminium Alloys." By Marie L. V. Gayler, D.Sc. Price 1s. 9d. net.*

Research on the effect of rapidly chilling molten light alloys.

R. & M. 1059.—*"Experiments on a Model of a Fokker (F.VII) Monoplane Wing." By A. S. Batson, B.Sc., D. H. Williams, B.Sc., and A. S. Halliday, B.Sc. Price 1s. 3d. net.*

Report of tests made to discover reasons for the reported controllability of the Fokker F.VII when stalled. Measurements were made of rolling and yawing moments, due both to rolling and to aileron movement at speeds varying from 40 to 60 ft./sec. on a model of 3 ft. span and 1.54 sq. ft. area.

A considerable speed effect was observed which makes it difficult to predict full-scale results from these tests, but the tests show that at small rates of roll the slope at the origin of the curves of rolling and yawing moments plotted against rate of roll is negative—in other words the conditions prior to stalling are maintained at the actual stall.

An appendix gives measurements of Lift, Drag and C.P. for this wing.

R. & M. 1106.—*"The Theoretical Pressure Distribution around Joukowski Aerofoils." By W. G. A. Perring, R.N.C., A.M.I.N.A. Price 9d. net.*

Calculations made to determine the influence of thickness and centre-line camber on the theoretical pressure distribution round aerofoils of Joukowski type. These calculations are made for nine aerofoils, of three maximum thicknesses (.05C, .10C and .15C, approximately), and of three centre line cambers (0, .026C, and .053C), each at $K_L = 0.1$, 0.3 and 0.5. The results may be summarised by saying that the maximum negative pressure on the upper surface generally decreases with increasing camber and increasing thickness.

This peak pressure is a minimum at the K_L corresponding to zero chord incidence.

Negative pressures on the undersurface at low values of K_L increase with camber and decrease with thickness.

High negative pressures should be avoided in the design of aerofoils because the rapid increase of pressure behind a negative pressure peak will cause breakdown of flow in a real fluid, and because at high velocities the effect of compressibility will modify the flow locally in regions of low pressure.

[*Note.*—All publications of the Aeronautical Research Committee are published by H.M. Stationery Office. They may be procured from The Aeroplane, Book Dept., 14, Bream's Buildings, London, E.C.4.]

Meteorology.

"Studies of Wind and Cloud at Malta." By J. Wadsworth, M.A. The Meteorological Office Geophysical Memoirs, No. 37. Published by H.M. Stationery Office, London. Price 2s. 6d. net.

An analysis of the diurnal variation of surface winds, of the upper winds and of the incidence of clouds at two adjacent stations on the N.E. coast of Malta.

HE INQUEST ON FLIGHT LIEUTENANT KINKEAD.

The inquiry into the death of Flt. Lt. S. M. Kinkead, who as killed at Calshot on Mar. 12, was opened by the Coroner r Southampton at Calshot on Mar. 15.

lt. Lt. Wilson said that, judging by the naked eye, Kinkead was ing at between 250 and 300 miles an hour.

he Coroner.—Was he using ethyl spirit?—That I cannot say. It s some special mixture.

Ir. R. E. G. Smith, attached to the Air Ministry as advisory gineer, interrupted the evidence with the remark, "If you are erring to the ethyl spirit as supplied to the public, no."

lt. Lt. Wilson said he could not say whether Kinkead was dis- ssed or affected by the fumes he might have inhaled after his ght on Sunday.

he Coroner.—Is it not common knowledge or common report that had been feeling the effects of high-speed flying, and that all se engaged in the Schneider Cup race had been feeling that, too?— annot say that.

lt. Lt. Wilson said that, after his first flight on Sunday, Kinkead d him that he had been very sick while flying, but he was all ht after breakfast.

he Coroner.—Is it true that competitors in the Schneider Cup race t the effects of the fumes?—I do not know.

dward Lancelot Ransome, attached to the Aeronautical Inspection partment of the Air Ministry, said that the machine was perfectly worthy when taken out on Monday. The Coroner.—Was it using yl spirit?—Yes—well, you can't call it ethyl spirit. It was using pirit containing ethyl of lead.

Ir. R. E. G. Smith, describing the fatal flight, said he considered t when Kinkead was returning from the direction of Cowes a second two before the machine dived he was at a height of about 250 ft. m the water. The machine then appeared intentionally to lose ght, as if the pilot was descending. After a few seconds it nose- ed into the sea from a height of about 50 ft. It disappeared in hower of spray. The Coroner.—What spirit do you say was being d?—I do not know whether I am at liberty to answer that question. e Coroner.—Did the spirit contain ethyl of lead?—Yes. The spirit tained tetra-ethyl lead. It is not the same as the commercial spirit yl.

s the spirit in general use, or is a certain amount being tested racing?—It is absolutely a special fuel for this type of engine in type of machine, and to the best of my knowledge it is not d in the same proportion in any other engine.

he Coroner.—Have you ever known anyone affected by this spirit the fumes from the spirit?—Yes.

ave they been made sick?—Flt. Lt. Kinkead is the only man I e actual knowledge of being made sick by these fumes.

Ir. Smith added that in the Schneider Cup race Kinkead used the e spirit in a Gloster machine.

o you know if he felt any ill-effects after the Schneider Cup race?— I have heard him say that he had felt the fumes from the aust in his stomach to a minor extent for a period not exceed- 24 hours after a particular flight, not necessarily every flight.

hat about the Schneider Cup race?—It was common knowledge ong the British team that Kinkead had felt some slight effects n the fumes of the fuel or the exhaust.

fter a description had been given of the diving and dragging rations and the recovery of the machine with Kinkead's body ned in the cockpit, evidence was given by Flt. Lt. Canton, a medical cer, who said that the *post-mortem* examination proved that Kinkead not drowned. There were many serious injuries, which he con- red were caused by Kinkead coming into violent contact with the plane. A specimen of the blood and parts of the lungs had, he l, been sent to Halton Laboratory with a view to ascertaining whether a-ethyl lead or carbon monoxide poison were present.

The inquest was resumed on Mar. 26.

Flt. Lt. T. J. Canton read the following report from the pathological laboratory at Halton:—

"Blood obtained from the lungs and liver showed no spectroscopic or chemical evidence of the presence of carbon monoxide. No lead or lead compound was found in either the lung tissue or in blood samples. Blood smears did not show any stippling nor any abnormal change. Smears of lung tissue were examined for the possible detection of crystals of lead tetra-ethyl hydroxide, but with negative results. A portion of the lung tissue was submitted to distillation tests. No odour of petrol, benzol, or ethyl was noted. There is no evidence in the lungs and blood samples examined of poisoning by exhaust or petrol fumes." Replying to the Coroner, the witness said he did not think it possible that Flt. Lt. Kinkead suffered ill effects from the vapour or fumes.

Flt. Lt. Wilson, Calshot, was recalled and questioned by the Coroner with regard to the compression of the air caused by a body moving at a great pace. "Does not that compression have some effect on the direction of the flight of the object, causing it to deviate?" he asked.

The witness.—It is very difficult to answer a question like that. The motion of a machine through the air is affected by air pressure on the various controls. All those controls are affected by the air. They are built for that purpose.

The Coroner asked if models were tested under great air pressure and whether from these experiments machines were designed to attain a certain speed?—The witness replied that that was the case.

The inquest was resumed on Apr. 20.

Major J. P. C. Cooper, Inspector of Accidents at the Air Ministry, said that as a result of his examination of the wreckage, he came to the conclusion that no part of the aircraft structure or controls broke or failed to function normally during the flight. Nor did the engine fail.

"I am of the opinion," he said, "that the machine stalled at a height of about 50 ft. when the pilot was attempting to land and that Kinkead misjudged his height above the water. I think he had abandoned the idea of flying the speed course."

The Coroner.—So far as you know there was no reason why he should abandon the flight?—My opinion is he abandoned it because of the weather conditions.

He added that he was definitely of the opinion that Kinkead did not do or omit to do anything as a result of being affected in the slightest degree by fumes.

He had heard of the evidence to the effect that the tail and rudder were fluttering, but he was convinced that that was an illusion caused by the reflection of the light off the rudder on to the tail.

There was a deflector on the windscreen to throw off any fumes from the centre block of cylinders. It would be a disadvantage to have the pilot entirely enclosed in the cockpit of a machine of this type. "We are out for speed," Major Cooper said, "and we have got to sacrifice certain things to attain that end." Everything possible had been done to eliminate danger from fumes and to reduce the possibility of accident to a minimum.

The Coroner.—I understand another attempt to break the "record" is going to be made, and it would be lamentable if there were another fatality.

Major Cooper.—I think you can take it that everything that can be done has been done and will be done.

He added that possibly in a year's time everybody would be flying at 200 to 300 miles an hour.

The Coroner said that Kinkead's death was due to misadventure caused by hemorrhage, shock, and extensive injuries as a result of the seaplane diving into the sea owing to loss of flying speed when he was attempting to land. "I feel sure," he added, "that everything possible will be done to eliminate the danger from fumes, and I am satisfied that in a machine of this type it is not feasible totally to enclose the pilot in the cockpit."

A verdict of "Death from Misadventure" was recorded.

THE UNDER-SECRETARY IN ITALY.—Sir Philip Sassoon, the Under-Secretary of State for Air, immediately after landing at Caserta, where he inspected the Cadet College of the Italian Regia Aeronautica. On his right is Major De Bernardi, the holder of the World's Speed Record, who acted as his pilot, and Flt. Lt. A. H. H. MacDonald, R.A.F.,

THE MOST MANUFACTURED ENGINE.

Everybody knows of the triumphs achieved by the Bristol Jupiter engines wherever they are used all over the World. These triumphs were sufficient evidence of the soundness of the design of the Jupiter. But everybody does not know how much the performances of the Jupiter have influenced those concerned with the manufacture of aero-engines in foreign countries. The best evidence in this respect is the astonishing number of firms who are now making Jupiter engines either as licensees or sub-licensees.

The Jupiter is now being built in eleven different countries without including the vast output from the Bristol Works. The firms which are making the Jupiter are :

France. *Société des Moteurs Gnôme-et-Rhône,* 34, rue de Lisbonne, Paris.

Japan. *Nakashima Aircraft Works,* Yurakukan Building, Marunouchi, Tokio.

Germany. *Siemens and Halske,* Siemenstadt, Berlin.

Belgium. *Société Anon. Belge des Constructions Aéronautiques,* Brussels.

Italy. *S.A.I. Ing. Nicola Romeo,* Via M.H. Traiano 33, Milan : and *Piaggio and Co.,* Via Petrarca, Genoa.

Czechoslovakia. *Walter a Spol,* Jinonice, Praha.

Switzerland. *Adolphe Saurer and Co.,* Arbon.

Spain. *Sociedad Union Naval de Levante,* Plaza de Canovas 4, Madrid.

Hungary. *Société des Acieries et Usines Métallurgiques,* Manfred Weiss, Budapest.

Yugo-Slavia. *Industrija Avijonskih Motora,* Rakovica.

Portugal. *Parque de Material Aeronautico,* Alverca.

THE GEARED JUPITER TYPE TEST.

A Jupiter Series VIII engine, built by the Bristol Aeroplane Co. Ld., fitted with an airscrew reduction gear, successfully passed the Air Ministry Type Test during last month.

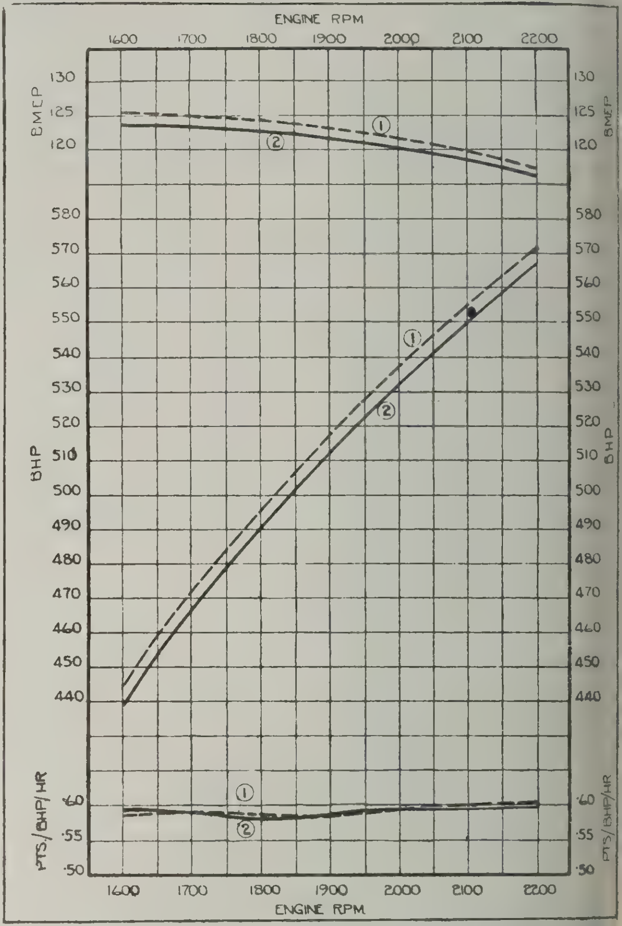
The Jupiter Series VIII engine is designed for Service use, has a compression ratio of 6.3 to 1, and it is not intended that it should be used at full throttle at sea-level. The series IX engine differs from the VIII in having a compression ratio of 5.3 to 1, and the series XI in having a compression ratio of 5.0 to 1. These two engines are intended to develop their full power low down, and in order that these two engines might be covered by the type test of the Jupiter VIII after completing the test on the original engine, a supplementary run of one hour at 540 b.h.p., 2,200 r.p.m., was made, with a compression ratio of 5.3 to 1.

The type test on the Series VIII engine followed the usual routine laid down by the Air Ministry. After a preliminary run of 1½ hours, during which a power curve was taken, 100 hours of running at 90% of the equivalent ground h.p. of the engine was completed in 10 and 15-hour non-stop periods. The engine then ran one hour at 2,310 r.p.m., 5% in excess of the maximum permitted speed, passed slow running and acceleration tests, and ran one hour at maximum permitted (2,200) r.p.m. and 6% in excess of its rated power. It was then run for a further 1½ hours to take a final power curve.

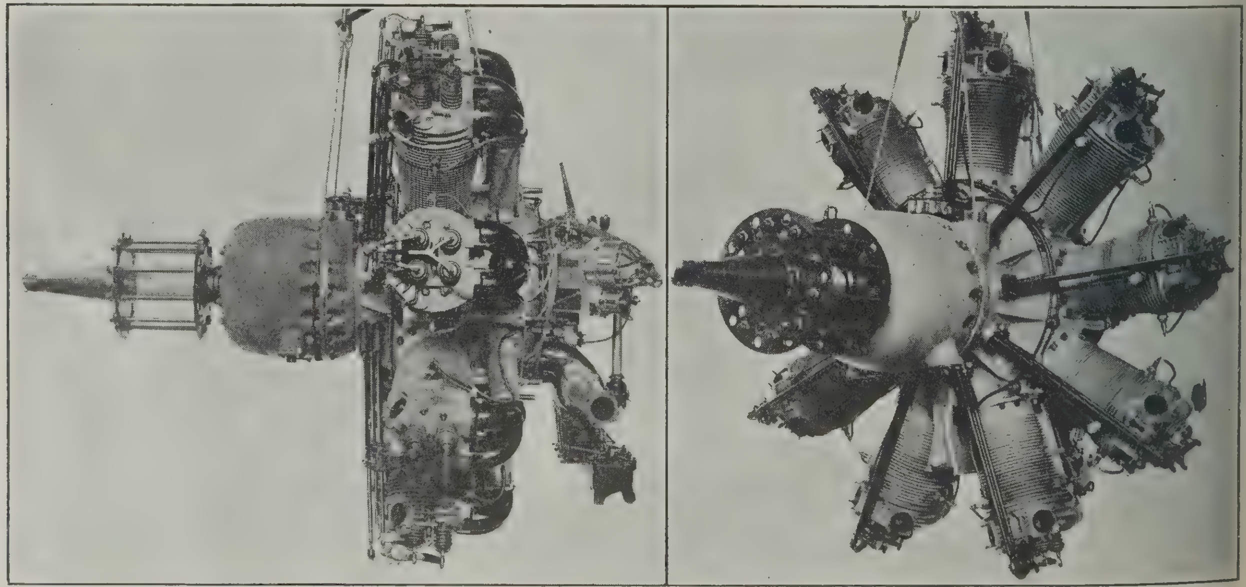
The two power curves which are reproduced show that the engine developed within 1% of the same power before and after type test.

The average consumption over the whole 100 hours of running at 90% full power was 27.5 galls. of fuel and 10 pints of oil per hour. The specific fuel consumption per h.p. hour at full throttle and various speeds is shown on the power curve, and it will be seen that the economy is remarkably well maintained over a wide range.

After completion of test the engine was stripped and all major parts were measured. The amount of wear throughout was exceedingly small, the maximum amount measured being .0012 in. on piston and gudgeon-pin diameters, and the engine was in excellent condition throughout.

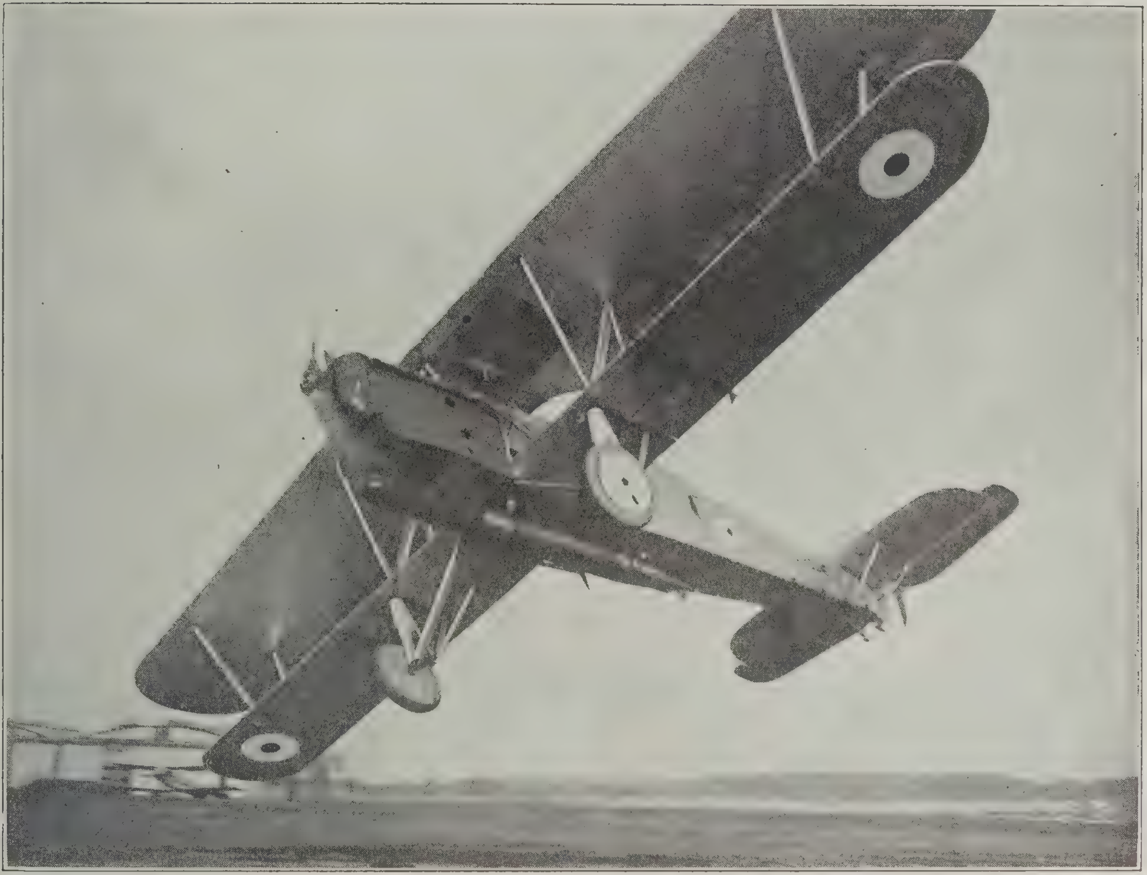


THE POWER CURVE OF THE JUPITER VIII ENGINE.—(1) Readings before and (2) Readings after the 100 hours' test.



THE GEARED JUPITER.—Two views of the Bristol Jupiter, Series VIII, engine which has just completed its type test. This engine is fitted with a Farman type reduction gear, the licence for the manufacture of which is held in this country by the Bristol Aeroplane Co. Ltd.

COASTAL DEFENCE



"Flight" Photo.

"The Hawker 'Horsley' Torpedo Bomber as illustrated is now in production. The machine meets in every respect the exacting requirements of torpedo carrying aircraft and can be considerably overloaded without impairing its efficiency."

THE H. G.
HAWKER ENGINEERING CO., LTD.

KINGSTON. S·B·A·C THE SOCIETY OF BRITISH AIRCRAFT CONSTRUCTORS BROOKLANDS.

A NEW FLIGHT TO AUSTRALIA.

On April 23 at 05.30 hrs. Wing Cdr. E. R. Manning, D.S.O., M.C., R.A.F., left Lympne on a Westland Widgeon (A.D.C. Cirrus engine) in an attempt to fly home to Australia. He reached Marseilles the same day.

The earlier portion of his route will differ from those taken by all previous travellers to the Middle East and beyond in that he will fly across the Mediterranean from France to Tunis by way of Corsica instead of going via Italy, Sicily and Malta.

Wing Cdr. Manning has been placed on the half-pay list for six months. A biographical notice concerning this officer appears on page 589 of this issue.

MR. STACK'S TOUR.

On the morning of Friday, April 20, Mr. Neville Stack, accompanied by Mr. Bowyer, the aeronautical correspondent of *The Daily News*, left Croydon at 07.00 hours for an extensive tour of Europe.

The machine which they are using is an Avro Avian Mk. III bearing the registration G-EBXD fitted with an A.D.C. Cirrus Mk. II engine which has been lent to *The Daily News* by A. V. Roe and Co. Ltd. The object of the flight is a demonstration of the practical utility, reliability and economy of the modern light aeroplane. Mr. Bowyer carries a typewriter in his cockpit and proposes to use it in the air.

The itinerary planned for this tour is London, Paris, Bordeaux, Madrid, Malaga, Tetuan, Oran, Algiers, Tunis, Catania, Naples, Rome, Pisa, Marseilles, Lyon, Paris, and London, and the whole journey of 4,000 odd miles will, it is hoped, be ended on May 3, in twelve flying days.

Le Bourget was reached at 09.40 hours, after 2 hours 40 mins. on Friday, and was left at 11.25 hours, and a landing was made at Bordeaux at 15.40 hours on the same day.

On Saturday, April 21, some time was spent at Bordeaux making adjustments to the engine, after which the trip to Biarritz took one and a-half hours.

Fog and cloud over the Pyrenees made it impossible to proceed further on that or the following day, and as certain defects in the engine were discovered during this enforced halt, the trip is being delayed until the arrival of spare parts from England.

LADY BAILEY'S PROGRESS.

On April 20 Lady Bailey left Tabora on a D.H. Moth which had been delivered to her by the D.H. Agent at Nairobi to replace the one she damaged at Tabora on April 10.

On April 21 she arrived at Broken Hill.

LADY HEATH'S PROGRESS.

Lady Heath, who is attempting to fly from Cape Town to England on an Avro Avian (A.D.C. Cirrus engine), was reported to be leaving Sollum on April 23 for Derna, where she would meet an Italian military air escort which would convey her along the coast to Benghazi, as Arab guerilla warfare continues.

SEAL SPOTTING WITH AN AVIAN.

Mr. Colin Caldwell has just concluded a season's seal-spotting in Newfoundland on an Avro Avian (80 h.p. A.D.C. Cirrus II engine). He landed on Quidi Vidi Lake on Mar. 31 after having encircled Newfoundland and covered 4,000 miles in 50 flying hours. On landing at Quidi Vidi the Avian was slightly damaged. On his way from Port Saunders he landed at Benton for re-fuelling and on taking off he damaged one ski.

When circling over Quidi Vidi to land it was seen that one ski was hanging loose, apparently unknown to the pilot. On landing the damaged ski and undercarriage struts caught in the ice and the left wing was damaged.

Mr. Caldwell left St. John, Newfoundland, on Feb. 18, flew to Port aux Basques, where he remained until Feb. 29. On that day he proceeded to Grindstone Islands and he had to remain there until Mar. 9 before he could return to Port aux Basques. On Mar. 10 he flew a compass course to Anticosti Island, and back to Magdalen Islands, in the Gulf of St. Lawrence.

Mar. 11 was the first good flying day with 10 hours continuous fine weather. A patch of seals, strung out on the ice, were located, although no main patch was seen. Sealing ships were informed and these proceeded to the locality to deal with the find. Ice in the Gulf of St. Lawrence was in excellent condition for landing with often a square mile or more of perfectly smooth ice.

On Mar. 17 Caldwell flew to Corner Brook, on the following day to Bonne Bay, on Mar. 20 to St. Anthony, and on Mar. 25 to Fogo and Port Saunders. From Port Saunders he flew to the Quebec shore, and thence along the shore over the Mekattina Islands back to Port Saunders. During this reconnaissance no seals were seen.

During one of his flights he dropped a letter to the twelve lonely inhabitants of Bird Island, an exposed islet which rises almost perpendicularly to a height of 300 feet out of the Gulf of St. Lawrence. The inhabitants of this islet, who are concerned with the maintenance of a lighthouse, are cut off from the outside world throughout the winter.

Mr. Caldwell reported very bad weather with a lot of fog and ground drift throughout the season. He was very pleased with the Avian and the Cirrus engine, neither of which gave a moment's trouble, and he reports that "a nicer little machine would be hard to find."

HARRODS' AIR WEEK.

Light aeroplane enthusiasts will be gratified to learn that Big Business evidently considers that there are commercial possibilities in the sale of light machines and their accessories.

Beginning on April 23, and continuing until April 28, Harrods Ltd. are holding a miniature aero show on the first floor of their stores in Brompton Road.

In addition to actual exhibits, short talks are given each afternoon at 15.30 hrs. followed by a "flying publicity film"—on Monday a little gem of a picture featuring Mr. Broad, a Moth, and a Lady, upon which one heartily congratulates Pathé Frères.

On the opening day Col. The Master of Sempill's address to an enthusiastic if youthful audience was brief but strictly to the point, and his observations as to running costs obviously received great attention. Mr. S. L. F. St. Barbe carried on the good work on Tuesday; on Wednesday Miss Winifred Spooner deals with the feminine point of view, while Thursday and Friday are the property of Messrs. Broad and Hope respectively.

Coming to the exhibits, these included a Moth with Handley Page automatic slots and metal airscrew, an Avro Avian, and a Blackburn Bluebird. Incidentally the sight of a Rolls Condor and a sectioned Napier Lion on either side of the Moth brought home very forcibly the fact that the light aeroplane does not belie its description. There were also several wondrous ladies attired in equally wonderful "one-piece flying suitings" the colours of which would turn the R.A.F. green with envy—but one confesses that one would rather be the seller than the wearer!

Undoubtedly the most popular exhibit of all was the Reid Reaction Test Apparatus, with Sq. Ldr. Reid himself and a quietly efficient assistant in attendance. It was almost impossible to approach the machine but when one did get near, it became evident that most of those who availed themselves of the opportunity of a free test were genuinely desirous of knowing their capabilities as future pilots and owners.

One remarkable fact was the preponderance and real knowledgeability of the youthful members among the sightseers. Standing at one of the exits watching the scene, one wondered whether it was altogether an unintentional stroke of genius which had ordered that the next Department to this Aero Show should contain layettes, cradles and all the paraphernalia necessary to infant welfare of yet another and probably more "air-minded" generation!—G. S. F.

A MOTH FOR THE U.S.A.

According to *Air Transportation* of New York City, Air Associates, Inc., of that city, has purchased a D.H. Moth fitted with Handley Page slots and this machine will be on display at the company's hangar at Curtiss Field, Long Island, N.Y., on and after April 30.

Air Associates Inc. are considering entering the machine in the 1928 Ford Reliability Tour. It will be piloted by Mr. James B. Taylor.

D.H. SERVICE.

After Lady Bailey crashed at Tabora on her D.H. Moth *en route* for Cape Town it was reported in a number of papers several days later that another Moth was being flown up from the Cape by Major Meintjes, S.A.A.F., for her to continue her flight. It is now announced that this is incorrect.

What happened was that immediately after the accident, Lady Bailey sent a cable to the De Havilland Aircraft Co. Ltd., in England, asking for their assistance. This company immediately communicated with their nearest agent in Africa, Commander D. C. Robinson at Nairobi, Kenya Colony, and instructed him to prepare a machine for Lady Bailey and deliver it to her at the earliest opportunity.

A standard Moth was taken out of store fitted up as a single-seater, with long-range tanks in the front cockpit, and flown 700 miles from Nairobi to Tabora within three days of receiving instructions from England.

The De Havilland company and its Nairobi agent are to be congratulated on this brilliant piece of service work which has enabled Lady Bailey to continue her flight with the minimum of delay. The fact that a spare Moth could be obtained with such promptitude in what is generally con-

HAWKER "HORSLEY" ROLLS ROYCE "CONDOR" CELLON DOPE.

Because it is the dope of proved efficiency Cellon Dope is used by The H. G. Hawker Engineering Co., Ltd., on all machines built by them of which the Horsley Day Bomber illustrated here is a fine example.

CELLON

"The Dope of Proved Efficiency"

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C 45-45

Lady Heath's Record

—first woman to fly from

Cape to Cairo

DIEU ET MON DROIT
BY APPOINTMENT TO HIS MAJESTY THE KING

HELIOPOLIS EGYPT. 4 APR. 28

THROUGHOUT SOUTH AFRICAN TOUR IN MY AVIAN LIGHT AEROPLANE FROM CAPE TO CAIRO CASTROL HAS GIVEN REMARKABLE RESULTS — PRESSURE NEVER DROPPED A POUND AND CONSUMPTION REMAINED CONSTANT THREE FIFTHS PINTS PER HOUR EVEN WHEN THERMOMETER CARRIED REGISTERED HUNDRED TWENTY FAHRENHEIT—SIMILAR ENGINES USING MINERAL OIL ON SAME ROUTE CONSUMPTION TREBLED OWING THINNESS IN HEAT

HEATH

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Wakefield House, Cheapside,
LONDON, E.C.2.

sidered to be a remote and inaccessible portion of the continent of Africa, is a very noteworthy example of De Havilland "Service after Sale."

THE HOLY OF HOLIES.

A Vancouver paper recently published the following paragraph :—

> Using a Moth plane fitted with a slotted wing safety device, Captain De-Haviland put the machine through a series of tests at St. Aglane airdrome, which demonstrated its power to check the plane's plunge when in various dangerous positions.

English as she is cabled often produces quaint effects, but one hardly expected it to canonise the De Havilland aerodrome, in spite of the neighbourhood of Canon's Park.

AN AID TO CLUBS.

One of the most alluring and convincing booklets one has met is that entitled *Learn to Fly*, which has recently been produced for the Yorkshire Aeroplane Club by M. S. Dodds, of 61-63, Quayside, Newcastle-upon-Tyne. The booklet begins with a foreword by Sir Sefton Brancker, as inspiring as ever, it gives a brief history of the Yorkshire Club, combined with the history of light aeroplanes, and it contains the constitution of the Club and all particulars about entrance fees and the cost of learning to fly and so forth.

It is beautifully printed, both the half-tone illustrations and the type being quite of the first class, reflecting the greatest credit on Mr. Brian Dodds, the head of the printing firm. Would-be aviators within reach of Leeds would do well to write for a copy to the Secretary of the Club, Lieut.-Col. J. Walker, O.B.E., D.C.M.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec. : H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending April 22.

Flying Time 38 hr. 50 min. *Instruction* 25 hr. 5 min. *Soloists* 13 hr. 45 min. *Instruction.—With Mr. F. R. Matthews*—Miss Johnson, Miss D. B Fletcher, Miss Wilson, Mrs. Guest, Messrs. L. F. Pretty, G. A. Stedall, G. E. Clair, A. S. Millar, J. Hansel, R. Ward, R. Drysdale Smith, W. H. Lane, A. S. Mulder, H. Sutton, W. L. M. O'Connor, E. R. Andrews, J. A. Brewster, D. Green, B L. Middleton, G. C. Gotheridge. *With Mr. S. L. F. St. Barbe*—Miss D. B. Fletcher, Messrs. E. Davis, A. P. Glenny, J. A. Crane, G. Black, A. S. Millar, J. P. Edinger, J. Bickley, R. G. Presland, J. G. Crammond, R. Ward, J. C. V. K. Watson, R. D. Smith, A. S. Richardson, F. C. Fisher, Lord Carlow. *Soloists.*—Messrs. P. W. Hoare, H. B. Michelmore, C. E. Murrell, B. B. Tucker, J. H. Saffery, G. H. Craig, J. A. Brewster, M. L. Bramson, E. E. Stammers, W. Hay, H. M. Samuelson, H. Solomon, A. S. Mulder, J. G. Crammond, R. Ward, E. C. T. Edwards, W. L. M. O'Connor, J. J. Hofer, T. C. Fisher, E. L. D. Moore, Major K. M. Beaumont.

On April 20 W. L. M. O'Connor passed the tests for his Aviator's Certificate and on April 22 J. A. Brewster also passed the tests.

The Lancashire Aero Club.

[Sec. : Woodford Aerodrome, near Stockport.]

Report for week ending April 14.

Flying Time 21 hr. *Instruction* 9 hr. 25 min. *Soloists* 6 hr. 5 min. *Passenger Flights* 4 hr. 15 min. *Tests* 1 hr. 15 min. *Instruction.—With Mr. Baker*—Messrs. Goss, Tweedale, Johnson, Harrison, Mills, Hartley, Greenhalgh, Garner, Hall, Allott, Slack, Taylor, Watson, Secker, Mason, Mehta, Miss Emery. *With Mr. Cantrill*—Miss Baerlein, Mr. Faulkner. *With Mr. Scholes*—Messrs. Goss, Hall. *Soloists (under instruction).*—Miss Baerlein, Messrs. Ruddy, Gort, Mills, Allott, Watson, Hall. *Pilots.*—Messrs. Michelson, Twemlow, Leeming, Crosthwaite, Gattrill, Williams, Goodfellow, Davison, Lacayo, Cohen, Twemlow, Cantrill, and Nelson. *Passengers.*—16.

Excellent first solos were made by Messrs. Mills and Allott. Mr. Watson also went solo, but misjudged his landing slightly. The machine will be flying again this week. Mr. Mills first joined as an ordinary member and gained a number of hours' experience as a passenger before starting lessons. As a result he took only four hours' dual instruction.

Report for week ending April 21.

Flying Time 17 hr. 30 min. *Instruction* 9 hr. 15 min. *Soloists* 5 hr. 15 min. *Passenger Flights* 1 hr. 45 min. *Tests* 1 hr. 15 min. *Instruction.—With Mr. Baker*—Miss Emery, Messrs. Watson, Birley, Allott, Slack, Mills, Mason, Mehta, Barlow, Johnson, Brooking, Stern, Harrison, Sellers, Stross, Pattreioux, Williams, Benson, Weale. *Soloists (under instruction).*—Messrs. Gort, Mills, Hall. *Pilots.*—Messrs. Twemlow, Lacayo, Meads, Cohen, Caldecott, Birley, Harber, Nelson, Goodfellow, Michelson and Williams. *Passengers.*—8.

Beastly weather. Messrs. Gerrard and Gort completed the tests for their "A" Licences.

The Newcastle-upon-Tyne Aero Club.

[Sec. : A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending April 22.

Flying Time 21 hr. 55 min. *Instruction* 8 hr. 45 min. *"A" Pilots* 12 hr. 15 min. *Tests* 55 min. *Instruction.—With Mr. Parkinson*—Miss Slade, Messrs. L. M. Middleton, F. W. Redshaw. *Advanced Dual.*—Messrs. J. Lloyd Browne, W. L. Runciman. *"A" Pilots.*—Mrs. Heslop, Miss Leathart, Messrs. R. N. Thompson, C. Thompson, J. D. Irving, W. L. Runciman, J. T. Percy, J. Lloyd Browne, N. S. Todd, D. Wilson, W. Baxter Ellis, H. Ellis, F. L. Turnbull, A. H. Bell and Dr. Alderson. *Passengers.*—13.

Most of the week's flying was done on Saturday and Sunday as strong winds prevailed during the week.

The Yorkshire Aeroplane Club.

[Sec. : Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet, Yorks.]

Report for week ending April 21.

Flying Time 12 hr. 55 min. *Instruction* 5 hr. 45 min. *Soloists* 6 hr. 35 min. *Passengers* 35 min. *Instruction.—With Mr. Beck*—Messrs. Clayton, Collins, Crowther, A., Dick, Ellison, Fitton, Mann, Rowley, Senior, Sugden, Miss Woodhead. *Soloists.*—Messrs. Clayton, Crowther, A., Crowther, H., Dick. *"A" Pilots.*—Messrs Ellison, Mann, I. Thomson. *"B" Pilot.*—Mr. Fielden. *Passengers.*—2.

An uneventful week as the Staff took their Easter Holidays on Tuesday and Wednesday. Thursday and Friday we had gales, snowstorms, etc., so that most of our flying was done on Sunday and Saturday.

The Midland Aero Club.

[Sec. : Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending April 21.

Flying Time 14 hr. 41 min. *Instruction* 9 hr. 12 min. *Soloists* 4 hr. 17 min. *Passenger Flights* 35 min. *Tests* 37 min. *Instruction.—With Flt. Lt. T. Rose*—Messrs. W. M. Morris, H. Tipper, J. B. Briggs, K. W. Symington, Capt. H. G. E. Tower, Messrs. O. L. Richards, H. Beamish, S. G. Hall. *Secondary Dual.*—Messrs. G. Aldridge, J. R. H. Baker, E. D. Wynn, A. B. Gibbons. *Soloists.*—Messrs. J. R. H. Baker, R. D. Bednell, H. Tipper, C. W. Fellowes, E. J. Brighton, S. H. Smith, R. L. Jackson, E. D. Wynn, A. B. Gibbons, J. Rowley, G. Aldridge. *Passengers.*—2.

On Wednesday Mr. H. Tipper was launched solo and put up a good performance.

The Hampshire Aeroplane Club.

[Sec. : H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending April 22.

Flying Time 34 hr. 10 min. *Instruction* 16 hr. 10 min. *"A" Pilots* 8 hr. 15 min. *Soloists* 4 hr. 35 min. *Passenger Flights* 4 hr. 20 min. *Test* 50 min. *Instruction.—With Flt. Lt. Swoffer*—21. *"A" Pilots.*—13. *Soloists.*—9. *Passengers.*—24.

Mr. Bott, after a short "refresher," made two successful solos. Mr. Scott-Hall and Mr. Curtis-Nuthall also completed their successful first solos this week.

Lt.-Cdr. Kidston completed his tests for his "A" Licence on April 18, and arrived at Hamble on April 21 from Stag Lane complete with Royal Aero Club Certificate, "A" Licence, and his own Moth, which he later flew back to Stag Lane.

Mr. Baynes and Mr. Shepherd are now in possession of their "A" Licences.

The Norfolk and Norwich Aero Club.

[Manager : F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending April 22.

Flying Time 7 hr. 45 min. *Soloists.*—Messrs. F. Gough, H. Mack, N. Brett, R. Potter, W. P. Cubitt, R. T. Harmer, H. A. Pank, W. A. Ramsay. *Passengers.*—21.

The very severe wintry weather has cut our flying time down this week.

We are pleased to say our pilot and passenger who were hurt last week are making good progress and we expect Mr. Fry will be back to duty during the week.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending April 22.

Flying Time 129 hr. 40 min. *Instruction.—Dual,* 31 hr. 10 min.; *Soloists,* 80 hr. 55 min. *Other Flying* 17 hr. 35 min.

One pupil made a successful first solo, and many others completed their courses.

Twelve new Moths were tested during the week.

The Henderson Flying School.

[Manager : A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending April 19.

Flying Time 14 hr. *Instruction.—With Mr. H. D. Davis*—Messrs. Mitchell, Hsiao, Quilter, Worley, Payne, Hughes, Habsburg, Col. Rice and Dr. Wall. *With Mr. A. E. Golds*—Messrs. Mitchell, Payne and Dr. Forcyth. *Soloists.*—Messrs. Crabtree, Hamilton, Patton, Bethune, Anderson, Whitley.

Mr. Hughes launched solo after 3 hr. 40 min. dual and Mr. Quilter after 3 hr. 35 min.

Messrs. Habsburg and Hamilton are now waiting for their height tests.

Lieut.-Col. G. L. P. Henderson is now on his way home after a very successful tour in South Africa and will take charge of the affairs of state next week.

Special comment should be made on Mr. Quilter's efforts as all his flying has been done at 7 a.m., before he started business.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 11; Monday, 2; Tuesday, 23; Wednesday, 22; ursday, 23; Friday, 19; Saturday, 23.

PERIAL AIRWAYS LTD.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 53, passengers 433, freight 14 tons.

R UNION:
Paris—London: Machines 31, passengers 120, freight 12 tons.

L.M.:
Amsterdam—Rotterdam—London: Machines 14, passengers 65, freight tons.

BENA:
Brussels—London: Machines 12, passengers 7, freight 2 tons.

UTSCHE LUFTHANSA AG.:
Amsterdam— London: Machines 10, passengers 34.

IVATE:
Machines 4, passengers 3.

Total number of trips by British Machines, 59, carrying 468 passgers. Foreign Machines, 75, carrying 345 passengers.

COMPARATIVE FIGURES.

eek ending April 21:
Machines, 123; Passengers, 665; Crews, 237; Total personnel, 902.
rresponding week, 1927:
Machines, 94; Passengers, 585; Crews, 163; Total personnel, 748.
rresponding week, 1926:
Machines, 83; Passengers, 440; Crews, 111; Total personnel, 551.
rresponding week, 1925:
Machines, 122; Passengers, 383; Crews, 154; Total personnel, 537.
rresponding week, 1924:
Machines, 45; Passengers, 196; Crews, 72; Total personnel, 268.
rresponding week, 1923:
Machines, 83; Passengers, 371; Crews, 131; Total personnel, 502.
rresponding week, 1922:
Machines, 104; Passengers, 193; Crews, 134; Total personnel, 327.
responding week, 1921:
Machines, 53; Passengers, 206; Crews, 66; Total personnel, 272.
responding week, 1920:
Machines, 44; Passengers, 44; Crews, 46; Total personnel, 90.

Croydon Notes.

lthough the weather recently has been a fair average nple of the usual type for this time of year it has been sistently kind to air transport for quite a long time, and t Monday, when heavy rain and low clouds persisted all and practically stopped flying, came as rather a shock r the heavy traffic of the past few weeks. Only one chine (Sabena) left Croydon, and only one (Imperial Airs) arrived, carrying a total of four passengers.

s the average number of passengers passing through ydon is now nearly one hundred per day, one bad day in a k means quite a serious loss to the air lines.

ith Summer Time coming into force at the beginning of s week the beginnings of Summer services are to be seen. erial Airways restarted their services to Basle and Zurich Saturday morning. This service leaves Croydon at 7.45 Passengers by this service may disembark at Basle, by taking the night train from Basle to Genoa, they catch the *Societa Anonima di Navigazione Aerea's* nier Wal seaplane service leaving that port at 7.00 hours, reach Ostia (Rome) at 11.15 hours, Naples at 13.15 hours Palermo at 16.45 hours on the following day.

lso as the Swedish Aero-Transport A.B.'s passenger sers between Malmö, Copenhagen, Hamburg, and Amster- have resumed operations for the season, the K.L.M. ice to Rotterdam now leaves Croydon at 9.00 hours T. (10.00 hours B.S.T.) and connects with the Swedish ice. Passengers by this service may reach Hamburg at hours, Copenhagen at 18.10 hours, and Malmö at hours.

ow that there is respectable accommodation for waiting engers at Croydon Aerodrome, some of the Air Lines taking advantage of the fact and are making their bookoffice counters very attractive by a display of posters, ographs, and literature, describing the attractions they to offer the public. This is particularly the case with K.L.M., who have arranged a large number of very ctive photographs on the counter, below plate-glass ls, and a liberal supply of excellently produced phlets are available for those interested.

perial Airways have temporarily lost the services of Mr. , who has just left for the United States to act as pilot r. Lowenstein during a tour of that country. Mr. Lowen- has arranged to buy a three-engined machine on his al, and expects to do a very large amount of flying during ext few months.

is business of the hire or purchase of special aeroplanes usiness or other purposes, is reaching quite large dimen-. Mr. Olley has recently made a tour on a Handley W.10 with a party of five American business men, in course of which he visited Paris, Cologne, Hannover, n, Prague, Vienna, Budapest, Munich and Basle.

. Armstrong, on a D.H.50, recently took Mr. Sharp o some years ago toured North Africa with Mr. (now Sir) Alan Cobham—to Barcelona and back, and then out to Morocco, whence he is now returning.

Apart from large scale tours of this sort there is quite a demand for special machine for single trips.

MIDDLE-EAST NOTES.

Mr. Talbot, of National Air Transport Inc. of Chicago, U.S.A., who recently spent some time on a big game shooting expedition in Central Africa, chartered one of Imperial Airways Hercules machines to transport himself and his party from Wadi Halfa, in the Sudan, to Cairo, in order to catch the s.s. *Mauretania* at Alexandria on March 17.

On March 13 a raiding party attacked a convoy of motorcars crossing the desert near Rutbah Wells, and so seriously injured a Mr. Abbosh, a passenger on one of the cars, that his life would have been endangered by further travel by car. A wireless message was sent to the pilot of an Imperial Airways machine then approaching Rutbah Wells, and Mr. Abbosh was picked up and taken to Baghdad, where he is making good progress.

SPEEDING-UP THE LONDON—PARIS TRAIN SERVICE.

According to a report from Paris in *The Morning Post* recently, the railway companies controlling the main railway and boat services between London and Paris have decided to speed-up their services to compete with the air line services.

A new service is to be started, leaving Paris at noon, which is due to arrive at Victoria at 17.30 hrs., taking only five and a half-hours for the journey. The journey from Paris to Calais is to be done non-stop, Customs and passport examinations will be made on the trains on both sides of the Channel, the Channel crossing is to be made in 55 minutes, and only ten minutes is to elapse between arrival of the steamers at Dover and the departure of the train.

Nothing has as yet been published concerning any speeding up of the service from London to Paris.

GREATLY EXAGGERATED.

According to a report published in some of the London morning papers last week, one of the K.L.M.'s new twin-engined Fokker F.VIII machines crashed near Utrecht on April 12, with serious injuries to nine out of ten of the passengers.

In actual fact one passenger received a badly-bruised arm and the remaining nine were unhurt.

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AERIAL NAVIGATION

PRINCIPLES AND PRACTICE OF AIR NAVIGATION.
Lieut. J. E. Dumbleton. 12s. 6d.

PRIMER OF AIR NAVIGATION.
H. E. Wimperis, M.A. 8s. 6d.

PILOT'S "A" LICENCE.
J. F. Leeming. (New edition.) 3s. 6d.

INTERNATIONAL GENERAL AERONAUTICAL MAP—"BRITAIN." 4s.

AIRCRAFT INSTRUMENTS.
H. N. Eaton. £1 5s.

GENERAL INSTRUMENT EQUIPMENT FOR AIRCRAFT, 1927. 3s. 6d.

AERONAUTICAL METEOROLOGY.
W. R. Gregg. 12s. 6d.

THE AIR PILOT, GREAT BRITAIN.
£1 12s. 6d.

Orders to the value of £5 or over will be sent post free in the United Kingdom. The cost of postage must be added to all net prices in these lists for orders under £5.

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The machine was making a demonstration flight with a number of journalists on board, when one engine stopped. The pilot proceeded on his remaining engine to a suitable landing ground, glided down, and at the last moment opened up his sound engine. Unfortunately he appears to have misjudged the amount of rudder required to overcome the turning effect of the one engine, the machine swung violently, touched a wing-tip, and turned on its nose.

The machine itself was very severely damaged, but the fuselage structure remained intact, and none of the occupants suffered any serious injury.

AIR MAILS SIMPLIFIED.

Apropos a complaint recently made in *The Times* concerning the difficulties of discovering in this country details as to rates of postage, services in operation, and the formalities necessary for securing that a given postal packet shall go by air, it is refreshing to see the information given by National Air Transport Inc., of Chicago, on the subject of air mail in the United States. This information is :—

(1) 10c. per half ounce anywhere in the United States.
(2) Use any postage, any envelope, any mail box.
(3) Endorse " Via Air Mail "—or use N.A.T. stickers, obtainable from National Air Transport.

DELIVERY BY AIR.

Three Junkers monoplanes of the F.13 type (Junkers L.5 engines), for the service of the Lloyd Aero Boliviana, were recently shipped to Buenos Aires, where they were erected and thence flown via Cordoba, Tucuman, Yacuiva and Santa Cruz to Cochabamba—a distance of about 1,500 miles—in three days.

A NEW CANADIAN FIRM.

A Canadian paper recently published the prospectus of a new firm called Reid Aircraft Co. Ltd., incorporated under Canadian law to manufacture and sell aircraft. The President of the firm is Mr. W. T. Reid, F.R.Ae.S., A.I.Mech.E.

Mr. Reid will be well remembered in this country as a designer with the Bristol Company. Thence he went to Canadian Vickers Ltd., at Montreal, as chief designer, and produced a number of quite interesting aeroplanes,—land machines, float machines and flying-boats,—several of which were bought by the Canadian Government and by commercial firms.

The other directors of the new firm are :—Capt. E. F. Peacock, M.C., Vice-President; Capt. W. S. Lighthall, D.F.C.; Major Thomas C. Lamb, Managing Director Ensign Oil Co. Ltd.; G. Erle Scott, of Canadian Industrial Alcohol Company Ltd.; Capt. C. Barclay-Drummond, Vice-President Mechanical Equipment Company; and Thomas Hall, President Laurentide Air Service Ltd.

AMERICAN DEVELOPMENTS.

Recent letters from America indicate that the Lycoming Motor Corporation of Williamsport, Pa., are starting out on a big programme of production of motors for light aeroplanes. They are said to be " tooling up " for 1,200 motors a year, and the type is said to be a 100 h.p. radial.

General Motors Inc., which controls a combine of some of the big automobile firms in the States, are said to be building an aeroplane at their Buffalo Factory.

The Wright Aeronautical Corporation, of Paterson, N.J., is planning to produce a new series of radial air-cooled engines for commercial work. Mr. Guy Vaughan, the Vice-President and General Manager, states in *Aviation*, New York, that they are to be built in three sizes, 140 h.p., 200 h.p. and 300 h.p. The parts of all three engines will be interchangeable as far as possible and all engines will designed to fit the same mounting, which will be identi to that of the Wright Whirlwind. Apart from th rumour says that all these new types will be supercharg

Another interesting piece of information is that Packard firm, not having met with much success with th high-powered water-cooled engines, are now experimenti with a high-powered air-cooled radial, and that they also engaged on the production of a Diesel type a engine, the design of which was produced in Germa Report says that the German designer of the engine been brought over to Detroit at vast expense, to superv the production of the earlier engines.

Another rumour states that Mr. Uppercu, one of founders of the original Cadillac Company, and more cently the backer of the old Aeromarine Co., in which lost a large pile of dollars, is behind the production o new motor for light aeroplanes, of the 4-cylinder type simi to the Cirrus. The production is said to be in the hands Mr. Cameron, at Keyport, N.J.

AEROPLANE PHOTOGRAPHS.

Copies of THE AEROPLANE photographs may be obtai from the Editorial Office of THE AEROPLANE, 175, Piccadi W.1, 6 in. by 8 in. at 2s. 6d. each, or 1s. 6d. each for th or more copies of one print, post free.

FAIREY METAL AIRSCREWS.

The Fairey Aviation Co. Ltd., of Hayes, Middlesex, manufacturers of the Fairey (licence Reed) metal airscre has received the following telegram from Lady Heath, wh attempting to fly from the Cape to England on an Avro Av (A.D.C. Cirrus engine) :—

> Did not have to even think of carrying spare propeller on my A which is first light aeroplane fly Cape to Cairo. Your metal functioned perfectly in even extreme heat hundred and twe fahrenheit South Sudan. This is third machine I have had on.—HEATH.

PERSONAL NOTICES.

MARRIAGE.

DEARLOVE—GARRATT.—On April 18, at the Brompton Orat Flt. Lt. Cuthbert Joseph Stanley Dearlove, R.A.F., son of Mr. Mrs. G. A. Dearlove, of Cardiff, to Christine Marian, only daug of Mr. and Mrs. P. J. Garratt, " Horris Bank," Newtown, Newbur

BIRTH.

SHOPPEE.—On Mar. 19, at Melbourne, to Hilda, wife of Flt. L. C. Shoppee, D.S.C., A.M., I.Ae.E., R.A.F.O.—a son.

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THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 18. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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"BESIDES WHAT HOPE THE NEVER ENDING FLIGHT OF FUTURE DAYS MAY BRING."—*(Milton.)*

THE HALTON AERODROME.—A view of the machines lined up during an ordinary afternoon's work at the aerodrome at Halton. Two more D.H. Moths and two Siskins are to be added to the equipment of D.H.9as, Avro Lynxes, D.H. Moths and Bristol Fighters already there. Every Aircraft Apprentice is taken for a passenger flight during his three weeks' training at the aerodrome.—*(" Aeroplane " photograph.)*

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AVRO

AVIAN

"CORROBORATIVE EVIDENCE"

WRITING on light aeroplanes in "The Aeroplane" of April 11th, 1928, "C. G. G." says:—

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£600
Ex-Aerodrome with complete standard equipment. Air Ministry fees for Certificates of Airworthiness and Registration are included.

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MAY 2, 1928.

THE AEROPLANE

Incorporating Aeronautical Engineering

VOL. XXXIV No. 18.

The Editorial Offices of "The Aeroplane" are at 175. Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
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ON SOME BOOKS.

Strictly speaking, this is not the book-reading season. People are supposed to buy books somewhere about the Autumn when the evenings are drawing in rather than in the Spring when daylight-saving tempts us all to disport ourselves in the open. Nevertheless, there are books which ought to be read so that we may the better enjoy our outings. And there are books which are worth reading when we are having a rest after our strenuous pursuit of out-door pleasure. Also there are books which ought to be bought for purely ommercial reasons. The books with which one deals herefter come under one or other of these headings.

The Experiences of a Test Pilot.

The Art of Flying. By Capt. Norman Macmillan, M.C., A.F.C. 159 pages. 35 illustrations. Duckworth. 5s. Supplied by THE AEROPLANE Book Dept., 14, Bream's Buildings, London, E.C.4.]

There is no pilot who is better entitled to speak or write n the art of flying than is Norman Macmillan. When one rst heard that he was going to write a book on flying one ad one's doubts about it. Norman Macmillan is essentially man of deeds and not of words, and one hardly thought hat he would express himself well on paper. But this book roves that, like many another Scottish writer, he can put is ideas on paper even though he may be himself quiet lmost to the verge of taciturnity in conversation.

Macmillan is essentially a test pilot. But he is a test pilot rather an unusual kind. There are plenty of people who an take machines up and throw them into every possible nd impossible attitude in the air and then come downstairs nd tell the constructor of the machine more or less fluently hat is the matter with the darned thing. There are some ho can even put up valuable verbal suggestions for the imrovement of the aeroplane. But there are few who take a enuine artistic pleasure in analysing aircraft performances.

HOW TO TEST.

One well remembers Macmillan's entry into the occupation civilian test pilot. He happened down at Hamble one day hen the late Vincent Nicholl, who was then doing all the airey testing, was so busy that he could not put through all he machines which were waiting approval. So Mr. C. R. airey resolved to give this new and unknown pilot a chance. nd Mac took up a III.D and stopped in the air for so long hat the Fairey people thought that he was having a jolly tle joy-ride at their expense.

When he alighted and came ashore, instead of explaining t length what he thought about the machine, he merely nded in a sheaf of notes that he had made of the machine's erformance at various heights, complete with correction ctors for temperature and humidity during each flight,—all nicely tabulated so that the designer could see at a lance just what the machine did under given circumstances.

Not long afterwards, Mr. Fairey, who liked flying in all s new machines, went up as a passenger with Macmillan n a very bumpy day. Every pilot has his own way of ying, and Vincent Nicholl's method was to let the machine llow about as it liked when once he had got the fore and ft trim right, merely keeping it on the right course with he rudder. Mr. Fairey, being accustomed to this method, as surprised to find that although it was a nasty gusty day he machine kept practically an even keel the whole time. hen he happened to look at Macmillan, and discovered that hough the machine was not moving at all the pilot was orking like a nigger the whole time,—which meant that he as feeling each wind-gust as it came along, before it was rong enough to move the machine, and was correcting for he gust so that, when it hit the machine, instead of rolling about and making it pitch badly it merely hit it a bump nd passed on.

Mr. Fairey happened to tell one of these incidents at the ime, and, as he is a man who seldom makes a mistake, one as watched the Macmillan method of testing with considerable interest ever since. At any rate, Mr. Fairey was so impressed by the accuracy and intelligence shown in the written report, and by the skill shown in the handling of the machine, that he promptly offered Mr. Macmillan a job. So as the test pilot of all the new and wonderful Fairey machines of recent years Mr. Macmillan has done work which is far more valuable to Aviation than ever he would have done if he had succeeded in flying round the World on the "Mac, Broome and Wilfred" tour (with Capt. Broome and Major Wilfred Blake) which gave so much joy to readers of THE AEROPLANE in 1922 and caused quite a good deal of newspaper comment at the time.

SENSE AND HUMOUR.

A book of this sort has been badly needed for a very long time. Capt. Gordon McMinnies' *Practical Flying* was, as its writer described it, a course of flying instruction, and very complete it was from the point of view of the pilot-instructor and mechanic. It was a wholly excellent publication and it ought to be republished and brought up-to-date. But Macmillan's book is quite different.

This is a curious mixture of good advice on every phase of flying, punctuated by very short descriptions of personal experiences and by brief bits of sound philosophy in the pawky Scottish manner. As for example in discussing the type of man who makes the best pilot he remarks,—"Mentality plays a greater part in the evolution of the finest air pilots than physique. Too much imagination places unnecessary strain on the individual, while too little places unnecessary strain on the aircraft."

Later he says,—"The sluggish brain and the heavy hand are better kept out of the pilot's cockpit for the safety of the aircraft." And later, again, he says,—"To all who take up flying, or who do already fly, I wish to give this fundamental advice :—*Think on the ground first.*"

Also the book has quite a number of really funny stories in it by way of argument in favour of doing certain things or of not doing certain other things. There is one delightful story which one has certainly not heard before. It concerns a pilot, trained evidently to fly strictly by his instruments, who dashed across an aerodrome a couple of feet off the ground and flew straight into a stone wall at the far end. When he picked himself unhurt from the wreckage he said to his friends "Funny, I wasn't expecting to crash just then! I thought I was 1,200 feet up. But I must have been looking at the rev. counter."—And there are others funnier even than that.

Macmillan is evidently one of those who believes in trusting one's own senses rather than one's instruments, although, as one of our finest test pilots, he probably spends more of his time watching instruments than do most people. He drives into his reader the need for a pilot to train his ear to the sound of his engine, so as to detect instinctively the slightest change in its note. He says very rightly that, apart from the sense of hearing, one's whole nervous system becomes in time a trustworthy detector of any irregularity in the feel of the machine. In fact he laments that the present type of seat parachute damps out one of the most sensitive sources of information.

AIR EXPERIENCES.

There is a great deal in the book which has certainly never been put into print anywhere else, as for example a very vivid description of the sensation of taking a machine up to its absolute ceiling and holding it there. This is peculiarly fascinating piece of writing because it combines perfectly plain mechanical instruction with graphic description of a kind which shows quite distinct poetic feeling.

A great many of his other experiences of the air will be new even to experienced pilots. There is a horribly vivid description of being chased down to the ground by an incipient water-spout from a monsoon-cloud in India. And there is another, equally vivid, of striking, at about 4,000 feet, in a perfectly clear sky an invisible disturbance which swung a seaplane round over and over again, and absolutely prevented it from climbing.

There are few people with greater knowledge of the peculiarities of the air than Macmillan, and certainly nobody so far has described these peculiarities anything like as well. Incidentally some of these peculiar air effects are very well illustrated by diagrams.

He makes a very interesting point when he states that experience has taught him (quite apart from all the theories on the subject) that electrically-charged clouds can upset the ignition of an aeroplane engine, and he says that certain types of clouds produce a peculiar type of cutting-out of the engine.

Sea and Land Views.

Following on his highly educative accounts of air conditions the author then delivers a quite informative dissertation on water-flying. Any experienced pilot of land-planes who thinks that he can get cheerfully into a sea-plane and teach it to behave will have his self-confidence somewhat shaken by this chapter. But at the same time he will learn a great deal which may save him from unpleasant incidents.

Aircraft designers also will learn a good deal from this chapter about hump speeds and other strange phenomena. As Macmillan himself says, "Common sense is the best mentor, but a hint or two in addition is worth a lot of costly experimenting."

His eighth chapter is headed "Types of Aircraft and Why." One confesses to having often wondered why, when one has been compelled to look at some of the aircraft which are somehow juggled into the air. On all the various questions implicit in that word "Why" Macmillan has his usual sane and dryly humorous opinions.

His views on the development of German and American aviation seem to agree very closely with those which have from time to time been expressed in The Aeroplane. One particularly likes his remark that geographically, at the dawn of the air era, Great Britain lies too close to Europe or too far away.

He argues that if we were a few hundred miles out in the Atlantic we should have a magnificent position between the Old World and the New as an aerial stopping place, whereas our actual position makes us a terminal point, while we are "too close to our neighbours to be outside their political calling list." All of which distinctly influences the types of aircraft in which we are interested.

One could go on quoting Macmillan's wise saws and modern instances for pages. But one has probably said enough to show that the book is thoroughly well worth reading. It assumes a certain amount of aeronautical knowledge on the part of the reader, which rather puts it outside the scope of the individual who wants to know from the beginning just what makes an aeroplane fly. But the more elementary parts of it certainly come down to the level of the intelligence of any reader of a newspaper who can understand the articles which are written by the "Special Aeronautical Correspondent," and that is not trying the reader very high.

Given that amount of knowledge anybody can understand the book. And yet there is in it, as one has indicated, a vast amount of practical knowledge of the air and of aeroplanes and of engines which will be genuinely educative to the most experienced test pilots and to the most knowledgeable designers and constructors.

At any rate it is well within the intellectual scope of any modern school-boy of 15 years of age or more, though it might be beyond the comprehension of the same boy's less instructed father. Therefore one can recommend it cordially as a present to any upper-form boy who is keen on flying.

There is a story that when a budding author inflicted a copy of his book on Lord Beaconsfield the statesman answered politely, if ambiguously, "I shall lose no time in reading your book." Time spent in reading Macmillan's book (like Lord Weir's famous elephant), can hardly be considered lost. Though the more knowledgeable of us will find that we already know most of it we shall all learn a great deal which is new, and we shall find many new sidelights on things about which we prided ourselves we already knew all there was to know.—C. G. G.

A Next War Dictionary.

[*The German-English English-German Military Dictionary (Deutsch-Englisches Englisch-Deutsches Militar-Wörterbuch).* By Kurt Hilmar Eitzen. 425 pages. Verlag "Offene Worte," Berlin. Price 8 Reichsmarks. Supplied by The Aeroplane Book Dept., 14, Bream's Buildings, London, E.C.4.]

There is a legend that once upon a time a Scot, being observed deep in a dictionary, was asked what he thought about it. To which he replied that while he had the greatest regard for the vocabulary the narrative appeared to lack continuity. In common with all dictionaries Herr Eitzen's lacks continuity of narrative, but to make up for it the vocabulary, besides being comprehensive, is amazingly humorous. It is not the unintentional humour of most English dictionaries compiled by foreigners, it is the intentional humour of a man of the World who has a very pretty wit.

Herr Eitzen was during the War an officer in the German Army and contracted somewhat serious injuries from an English air-bomb. Before that he was, one believes, an undergraduate at Oxford. Such is the spell which our great University casts over those who know and love it, that even the bombs failed to remove Herr Eitzen's Oxford manner. And his dictionary should serve as a valuable link between "The Two White Races" when we come to work side by side in the next war.

An excessively military friend tells one that strictly from the Army's point of view there are errors in the book. He argues, with perfect propriety, that a military dictionary is too big a job for one man, and should be compiled by an experienced military committee of the two nations whose languages are concerned. And he is doubtless right in his statement that the War Office German-English dictionary is more accurate and more complete than that of Herr Eitzen.

An Aeronautical Vocabulary.

On the other hand, the War Office dictionary is probably a good deal bigger and is not so readily accessible to the public, and it certainly does not contain the extraordinarily full aeronautical vocabulary which Herr Eitzen has combined with his war words,—recognising the important part that flying is going to play in the next War. A military dictionary of pocket size which is so up-to-the-moment as to include "slotted wing" and "wing-flutter" is certainly a desirable possession. And the book is equally up-to-date as a motoring dictionary,—aircraft and motor-cars being just as much war material as they are vehicles for civilian tourists.

Herr Eitzen, as befits a former Oxford undergraduate, has a rooted affection for slang, sometimes with results which may bring disaster on users of his dictionary. For example, he gives for the word "guy" the correct word in German engineering, but he also gives the word "kerl" (*Old English* "churl" or "karl"), which is the German slang equivalent for the American word "guy." One rather wonders that he has omitted the words "bloke" and "cove."

How full is his aeronautical glossary may be judged by the following list of words taken haphazard :—Stalling point, anti-stall gear, Sidcot suit, forced landing, tarmac, zoom, flatten out, dud, service ceiling, and airminded.

Some of his slang is even a trifle obsolete in these days, though it was very much current during the War 1914-18, as, for example, Bolo, kiwi, blimp, cady, clutching-hand, Cook's tour, and sundry others.

Leaving out the purely military value of the work, any British aviator, who is thinking of touring in the Northern part of the Continent of Europe, where school-boy French is not likely to help him, will find that this dictionary will certainly get him anything that he wants in the way of aircraft parts or supplies.

And everybody who intends to visit the great civil aircraft show in Berlin in October must certainly take a copy with him.—C. G. G.

Man-Power Flying.

[*An Approach to Winged Flight.* John D. Batten, M.A., LL.B. 56 pages, 11 photographs. The Dolphin Press, Brighton. 5s. nett. Obtainable from The Aeroplane Book Department, 14, Bream's Buildings, London, E.C.4.]

In this little book, Mr. Batten deals very interestingly with that evergreen subject the possibility of flying by human muscular power. Whether one believes or disbelieves in such possibility, the subject is, at any rate, always of interest and Mr. Batten deals with it in a singularly interesting way.

He explains the muscular arrangements which enable birds to fly, and then treats of a mechanical imitation of such muscles. He discusses the possibility of using silk in the construction of what he calls a "catapult torse"—an arrangement rather like the Roman siege-catapults of our school-days—and proposes to use this as a spring arrangement to give the necessary power to human-driven wings, the power being applied by the human being through levers worked by arms and legs.

His ideas are distinctly interesting, and although in these days one can buy a lot more for 5s. than is contained in his book, one cannot buy the same information either for less or more.—C. G. G.

AMERICAN AWARDS FOR ATLANTIC CROSSINGS.

A Bill has passed the U.S. Senate which authorises the bestowal of the recently-created American Distinguished Flying Cross on Baron von Hünefeld, Capt. Köhl, Major Fitzmaurice, General the Marchese de Pinedo, Capt. Costes and *Lieut. de Vaisseau* Le Brix.

Provision is also made for the striking of special gold medals to be awarded to Colonel Charles Lindbergh and Mr. Lincoln Ellsworth, the latter being honoured for the part he played in the flight across the Polar Regions with Mr. Amundsen and Col. Nobile in the airship "Norge" in 1926.

"The racing Napier Lion engine is a superlative example of British engineering and that form of genius represented by the capacity to take infinite pains."

Times Trade & Engineering Supplement.
31st March, 1928.

The same infinite care, the same genius, the same engineering skill and the same high-grade materials, employed in the design and construction of the Napier racing engine, which has so conclusively proved the superiority of British engineering skill, are used in the production of *every* Napier engine.

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Spain to Buenos Aires by a Dornier-Napier flying boat	12,518 engine miles
World's Speed Record over 100 kilometres by a Supermarine-Napier seaplane	speed 283·313 m.p.h.

LADY BAILEY'S FLIGHT.

At 12.40 hours on April 30 the Hon. Lady Bailey reached Cape Town in a D.H. Moth (A.D.C. Cirrus engine), after having flown from London under circumstances which stamp her flight as one of the most notable solo undertakings since the advent of the light aeroplane. She was received on arrival by the Mayor of Cape Town, by Sir Abe Bailey, and by representatives of the local Cape Town Flying Club.

Lady Bailey left Stag Lane on March 9, almost secretly, the only spectator being Mrs. Geoffrey de Havilland. She remarked before leaving that the flight would be a holiday. Her first objective was Paris, but she was forced down at Sacy-le-Petit owing to fog. She reached Le Bourget the next day, and continued by way of Lyons, Marseilles, Pisa, Rome, Naples, and Catania, where she arrived on March 14.

On March 15 she reached Malta. From Malta she proposed to fly to Khoms, but was dissuaded from so doing by the R.A.F. On leaving Malta for the North African coast she was escorted for 100 miles by R.A.F. seaplanes.

On April 20 she reached Cairo. Here she was informed that she would not be allowed to fly over the Southern Sudan unescorted, and her Moth was locked up.

On hearing the news *The Johannesburg Star* cabled Lady Bailey, offering the services of Lieut. Bentley, S.A.A.F., who was at Jinja on a flight from Cape Town to London, also on a D.H. Moth, as escort over the affected area from Khartum to Mongalla.

This offer was accepted, and as soon as the full details of the escort had been arranged Lady Bailey's Moth was released, and she left Cairo on March 27. She reached Aswan on March 29, Wadi Halfa on March 30, Albara on March 31, and Khartum on April 2.

She left Khartum with her escort on April 5, arrived at Nimule on the following day, Kisumu on April 8, and Tabora on April 9. The landing here was marred by the combined influence of heat and altitude, which took her unawares, and her machine was damaged to the extent that repairs were impossible in the absence of certain essential spares.

She immediately cabled her husband, Sir Abe Bailey, in Cape Town, and the De Havilland Aircraft Co. in England. The former arranged to purchase a Moth from Mr. J. H. Veasey, of Johannesburg, the De Havilland South African agent, and this machine was despatched to Roberts Heights, Pretoria, the S.A.A.F. Aircraft Depot, where it was overhauled and tested.

On April 16 this machine left Pretoria, piloted by Major Meintjes, M.C., A.F.C., S.A.A.F., and reached Tabora on April 18, after having flown from Pretoria to Broken Hill non-stop in 11 hours.

On April 20 Lady Bailey left Tabora on her new Moth and flew to Broken Hill. Here she contracted influenza, and was delayed for four days. On April 24 she reached Bulawayo. On April 26 she was forced to land at Nylstroom through missing certain landmarks, and she spent the night at Warm Baths Station, Transvaal.

On the following day she left for Pretoria, escorted by nine machines belonging to the S.A.A.F., and on arrival was received by the officers of the South African Air Force and a large gathering of citizens. She proceeded the same day to Johannesburg, escorted by six S.A.A.F. machines, and was met by Miss Douglas, the first lady pilot of the Johannesburg Flying Club, on the Club Moth. On April 29 she reached Beaufort West, and on the following day she arrived at Cape Town.

Lady Bailey has stated that the flight was long and interesting, with nothing extraordinarily difficult, her only difficulty being when her Moth was locked up at Cairo. Constant flying was not over-exhausting or alarming.

This magnificent flight is the longest ever made by a woman pilot, and the quiet and unassuming way in which it was undertaken stands out as an example that could be advantageously followed by many who are out to demonstrate the mobility and practicability of the light aeroplane as distinct from the pure seeking of personal publicity.

The D.H. Moth and the A.D.C. Cirrus engine have again proved their excellence and thorough reliability in the hands of a capable pilot. The fact that Lady Bailey only learned to fly on a Moth in 1926 adds very considerably to her brilliance as a cross-continent pilot, and proves conclusively the excellence of the Cirrus-Moth, not only as a training machine, but also as a machine that is capable of coping with any task with complete success.—L. B.

TOWARDS THE EAST.

On April 6, Mr. J. S. Newall and Mr. Neville Vintcent who left Stag Lane aerodrome on Jan. 9 on two D.H.9 biplanes on a flight towards the East arrived at Karachi.

The explanation of the comparatively leisurely progress is that they have been making considerable stays at their various ports of call, carrying passengers, taking aerial photographs, and indulging in the many odd ways of spreading "air-mindedness" among the inhabitants of the East.

ALESSANDRO GUIDONI.

On Feb. 27, Lieut.-General Alessandro Guidoni, Chief of the Technical Services of the *Regia Aeronautica*, was killed while experimenting with a parachute over the Montecelio Aerodrome near Rome. He was flying with Lieut. Freri, famous as the demonstrator of the Salvator parachute, and according to the reports, on leaving the aeroplane at a height of some 3,000 feet, he became somehow entangled in the cords of the parachute, which consequently failed to open,—though over 2,000 successful drops have been made with this type of parachute.

There are those who have asked why an officer of his high rank should have been risking his life in such an experiment. The answer is that General Guidoni believed in doing himself whatever he had to ask others to do, and, as parachutes have become necessary equipment for all Service aircraft, he, like Sir John Salmond and other R.A.F. officers of high rank, conceived that it was his duty to have the experience of dropping with a parachute.

Alessandro Guidoni was not only one of the most valuable senior officers of the *Regia Aeronautica,* he was one of the great pioneers of the World's Aviation. He and Lieut. Savoia were the first Italian officers to fly.

In 1911 he was one of the first experimenters with seaplanes. He fitted a pusher biplane with floats and under the floats he arranged a series of true hydro-planes, known later as Guidoni *pallettes,* designed to raise the floats off the water and to give a quicker take-off.

From these Guidoni *pallettes* were developed the waterplanes with which Lieut. Burney, R.N., and Mr. Harry Busteed (now Wing-Commander, R.A.F.) experimented on a Bristol machine before the War 1914-18. And these waterplanes formed the basis of the famous Burney paravanes which saved so many ships from enemy mines during the War.

Also from the Guidoni *pallettes* were developed the high-speed air-driven hydro-planes with which the late Dr. Alexander Graham-Bell and Mr. Baldwin experimented in Nova Scotia after the War. Some of these craft reached a speed of 75 m.p.h.

Of General Guidoni's services during the War one has no personal knowledge. One only knows that as an engineer-officer of proved ability he did work of high value and won deserved promotion. He was A.D.C. to the King of Italy, and he held the C.B.E., the *Legion d'Honneur,* and the American Distinguished Service Medal.

Soon after the Armistice he was appointed Italian Air Attaché at Washington, where his qualities as an engineer, a sportsman and a gentleman of the Old World, won for him that personal regard and high esteem which the true American never fails to give to the best that Europe sends across the Atlantic.

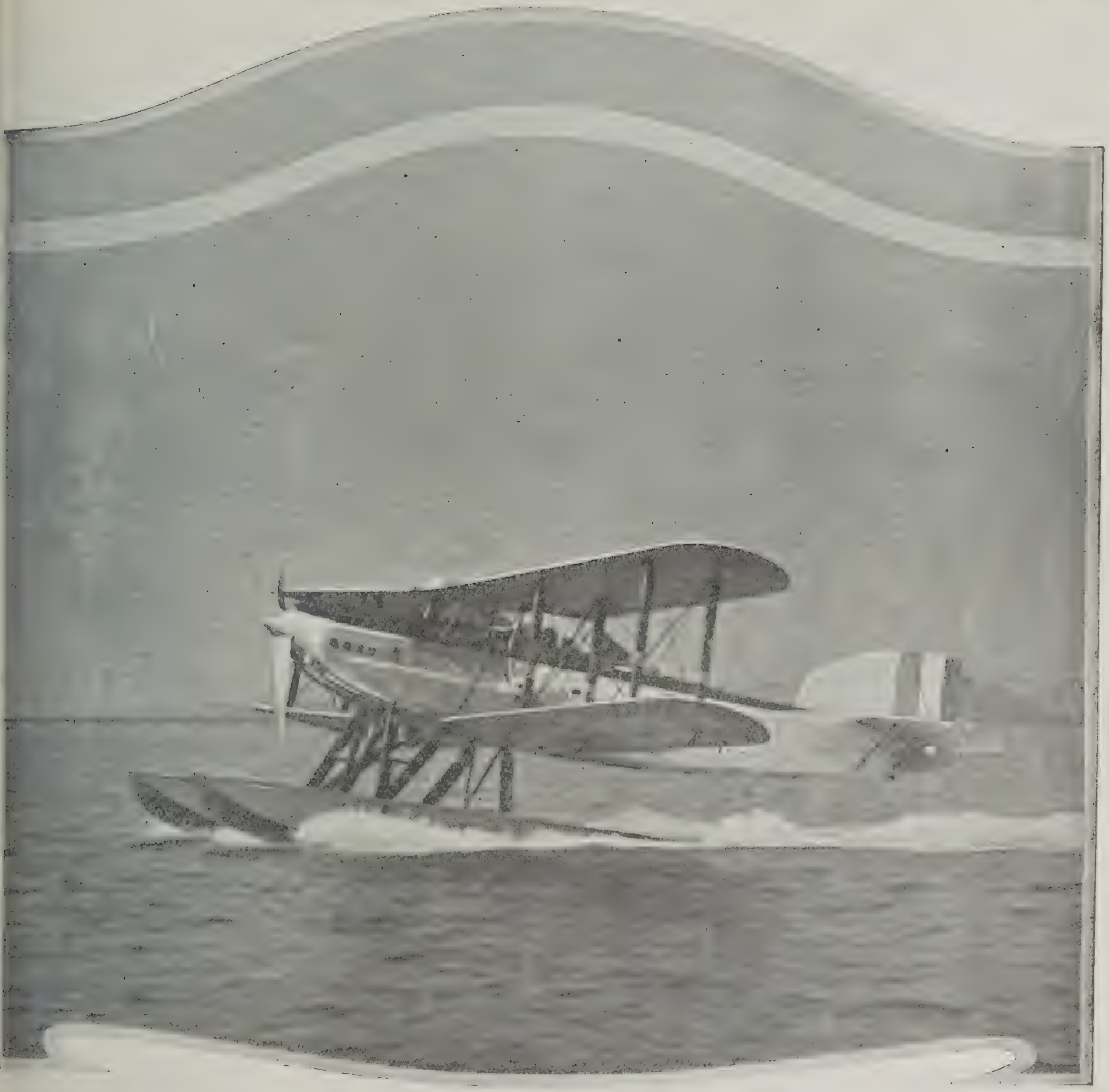
At the end of his tour of service in America he was accredited as Air Attaché to the Italian Embassy in London. His record as one of the World's aeronautical pioneers assured to him a welcome worthy of his standing, but very soon his personal charm won for him the affection of all with whom he met in the course of his duty. And when he returned to Italy last year to take up the arduous duties of head of the Technical Department of the *Regia Aeronautica* we all felt as if one of our best friends was leaving us to do duty abroad rather than that a distinguished foreign officer was going home on promotion to higher responsibilities.

Alessandro Guidoni endeared himself to us by his keenness as an aeronautical engineer, with whom a technical discussion was always a pleasure, and by his gently ironical sense of humour, which appealed particularly to those of us who have passed through so many ups and downs in the development of flying. His humour, as usual, was a veil to a deep sincerity which a man of his strong character does not lightly display.

That he should have been killed so soon after assuming his new and great responsibilities is a real tragedy. After all his years of work he had attained to the highest position open to an engineer-officer. With the whole-hearted support of General Balbo and His Excellency Mussolini he had the finest possible opportunities of raising to the highest level the technical equipment of the *Regia Aeronautica,* and no man in Italy was better fitted for the work.

Another of Italy's distinguished officers will continue that work, but those of us who knew and admired Alessandro Guidoni will always lament that we were not permitted to see his ability attain to its highest possibilities. By his death Italy has lost one of her most distinguished sons, and many of us have lost a friend whom we shall never forget.

C. G. G.



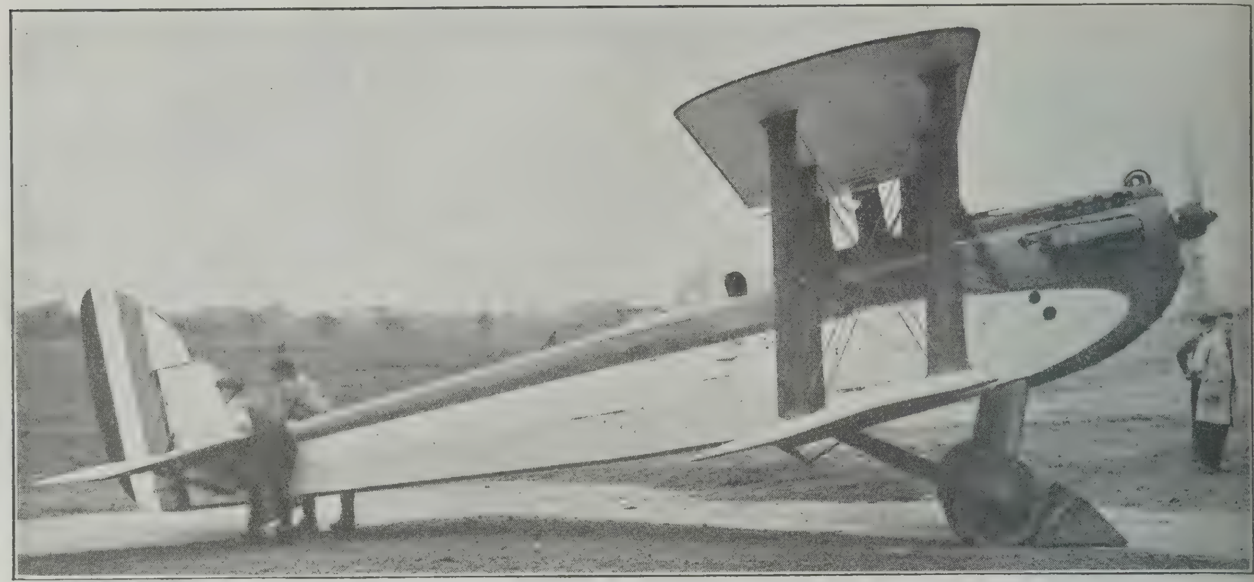
The Fairey III.F. as a Seaplane.

Wide adaptability, outstanding performance and exceptionally robust construction have put the Fairey III.F. (Napier "Lion" engine) into full production for His Majesty's and Foreign Governments. The demand for this successful aircraft in both its General Purpose and Fleet Air Arm types is the response to the creation of the only British Aircraft designed to meet with equal facility the Naval and Military requirements of the Royal Air Force, and to undertake these varied duties without loss of performance. Its already wide adaptability is further extended by the interchange of the wheel and float undercarriages—an operation taking about two hours.

FAIREY

Aircraft

THREE BRITISH WORLD'S RECORDS.



THE MACHINE.—The D.H. Hound (550 h.p. Napier Lion XI engine) on which Mr. Hubert Broad put up three World's Records on April 26-27.

On April 26, Mr. Hubert Broad, flying the D.H. Hound (550 h.p. Napier Series XI engine) and carrying a useful load of 1,000 kgs. (2,204 lbs.), covered a measured distance of 100 kms. at an average speed of 160.861 m.p.h., beating the previous record held by M. Lasne (France) who on Oct. 16, 1925, flying a Nieuport-Delage 42C-1 (500 h.p. Hispano-Suiza engine) covered the 100 kms. at an average speed of 153.039 m.p.h.

On April 27, in less favourable weather, Mr. Broad covered 500 kms. with the same load, at an average speed of 158.656 m.p.h. The previous record over this distance was held by M. Jezek (Czechoslovakia) who on Oct. 13, 1927, covered the distance at a speed of 143.586 m.p.h. on a Letov S.16 (450 h.p. Hispano-Suiza engine).

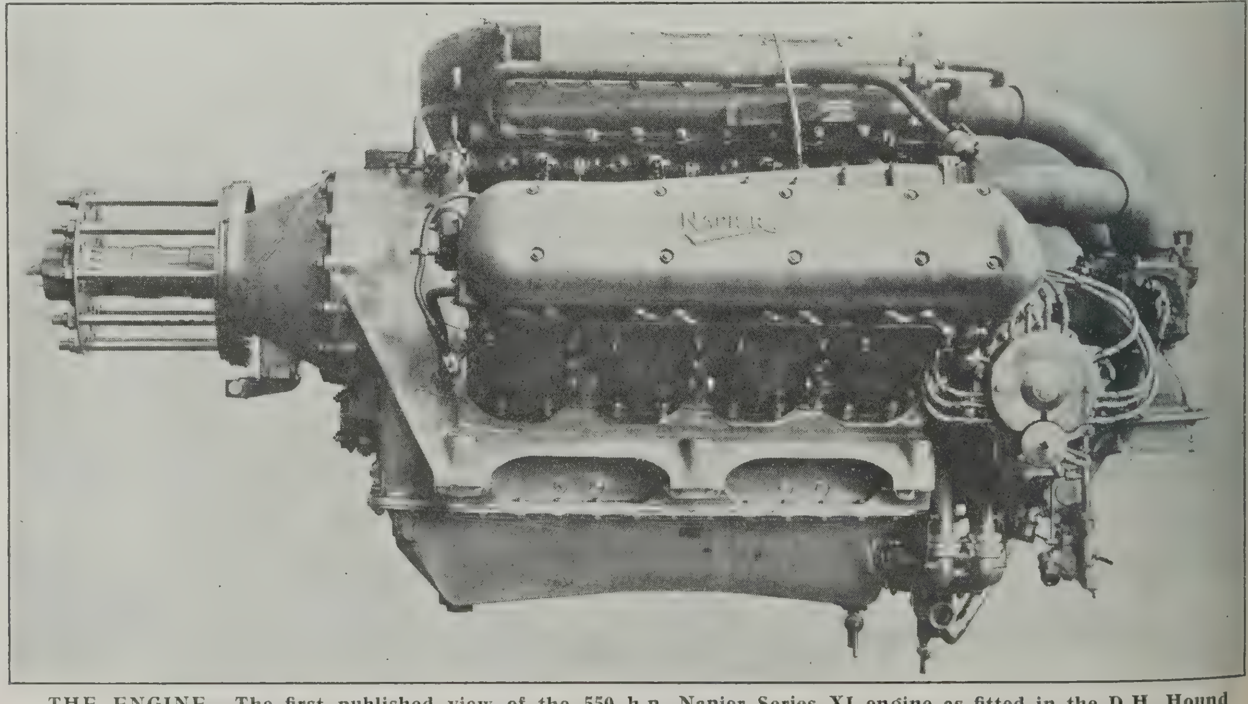
On his second lap of the 500 km. course Mr. Broad beat his own record of the previous day by covering the 100 kms. at a speed of 162.284 m.p.h.

Over the whole 500 km. course Mr. Broad also beat the previous World's Record carrying a useful load of 500 kgs. This was held by M. Lasne (France) who on Sept. 1, 1925, made an average speed of 155.012 m.p.h. flying a Nieuport Delage 42C-1 (500 h.p. Hispano-Suiza engine).

The D.H. Hound was designed as a two-seat general purposes biplane and for the purposes of the above record-breaking attempts it was only altered to the extent of removing the back gun-mounting and covering in the bac cockpit and the front gun position. The 1,000 kg. (2,204 lbs. load was carried in the form of lead ballast and was entirel exclusive of petrol, oil and pilot, which, alone, weighed 1,05 lbs. The Hound weighed 6,500 lbs. fully loaded.

Great Britain now holds or claims five World's Records ou of the seventy-two that has been homologated by the *Fédéra-tion Aéronautique Internationale.* Of these four have bee put up by the De Havilland Aircraft Co., Ltd., three wit the Hound, and one with the Tiger Moth. The remainin record is held by the Supermarine S-5 (Napier Lion engine) which, flown by Flt. Lt. Webster, R.A.F., made a speed o 283 m.p.h. over 100 kms. during the last Schneider Troph Race.

The D.H. Hound has been flying for over twelve months It has competed in the R.A.F. General Purposes Competition and has been turned down. It has out-fought and out climber a high-performance single-seat fighter. It has nov demonstrated that it can do over 160 m.p.h. with twice th normal load of a general purposes machine. While it is admitted that the "general purpose" load takes up considerably more room than that absorbed by the 1,000 kgs. of lea ballast, the fact still remains that the Hound possesses a all-round performance which is in advance of that possesse by any machine which is at present in use in the R.A.F.



THE ENGINE.—The first published view of the 550 h.p. Napier Series XI engine as fitted in the D.H. Hound on which Mr. Broad broke three World's Records.

Capt. Broad with the record-breaking de Havilland Hound in flight.

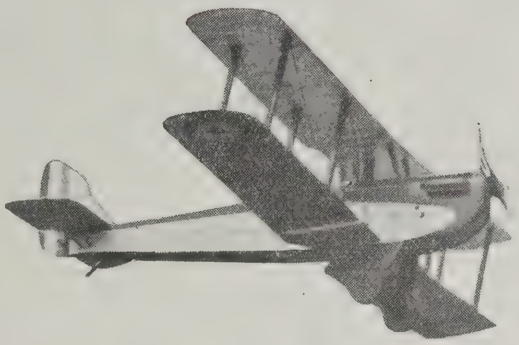


Photo. by courtesy of Sport and General Press Agency Ltd.

THREE WORLD'S AIR SPEED RECORDS FOR BRITAIN

On April 27th, 1928 **CAPT. H. S. BROAD, A.F.C.** flying a

DE HAVILLAND HOUND

550 H.P. NAPIER-LION ENGINE

BROKE THE WORLD'S

100 KILOMETRES RECORD

CARRYING A LOAD OF 1000 KILOGRAMMES
at an average speed of

162·284 m.p.h.

500 KILOMETRES RECORD

CARRYING A LOAD OF 1000 KILOGRAMMES
at an average speed of

158·656 m.p.h.

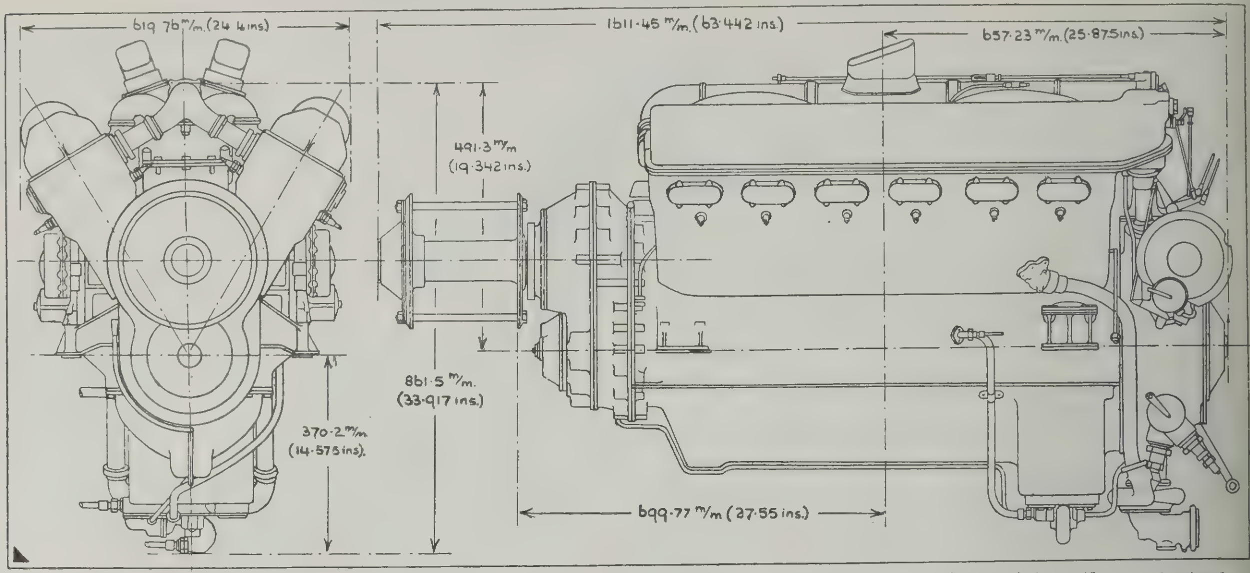
(Records subject to homologation by F.A.I.)

This last speed also broke the World's 500 Kilometres Record carrying 500 Kilogrammes, Capt. Broad's speed of 158·656 m.p.h. being over 5 m.p.h. faster with double the load. Five Air Speed World's Records are held by Great Britain, FOUR OF WHICH STAND TO THE CREDIT OF DE HAVILLAND MACHINES.

THE DE HAVILLAND AIRCRAFT CO., LTD., STAG LANE AERODROME, EDGWARE, MIDDLESEX

Streets

THE ROLLS-ROYCE F.11 AND F.12 ENGINES.



THE ROLLS-ROYCE F.11 AND F.12 ENGINE.—Outline drawings of the new engines giving the principal overall dimensions.

The Rolls-Royce F.11 and F.12 engines are developments of the F.10 type which was illustrated and briefly described in The Aeroplane of June 22, 1927. They differ from that engine in some details, in having airscrew reduction gears, and from each other in having reduction gears of different ratios. Both the F.11 and F.12 engines have passed their type tests and are now in production.

Except that they are of the twelve-cylinder Vee type the "F" types differ very widely in their construction from earlier Rolls-Royce aero-engines. They embody a totally different cylinder construction, in some respects entirely novel, and they are remarkable not only for their very low weight, but also by a very compact assembly and a low frontal area.

The maximum width of the F.11 and F.12 engines is about 1½ inches less than that of any of the modern American engines of equivalent size, and the overall height is roughly the same, and the overall length is within an inch or so of that of the most compact of American engines of equal power, though the latter has no reduction gear. They can thus claim to have probably the smallest frontal area of any engine of 500 h.p. yet in production.

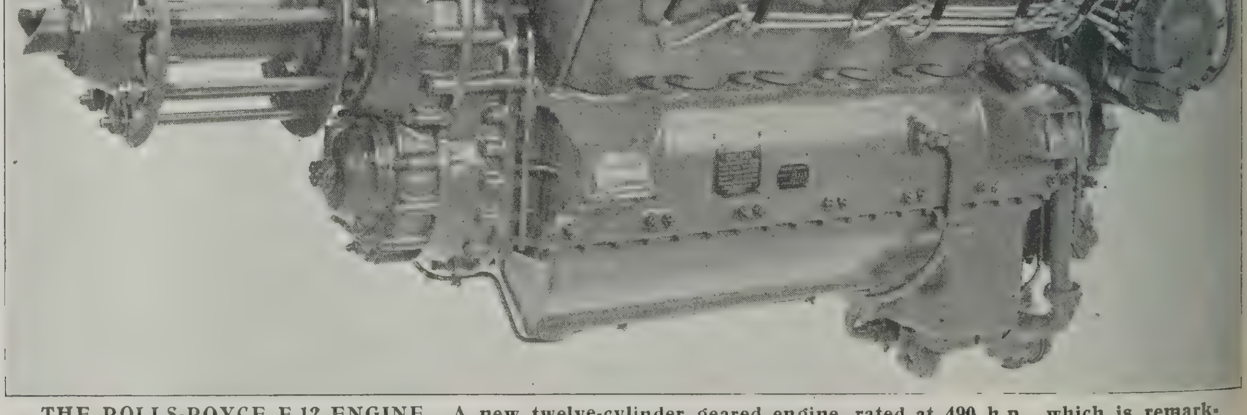
Cylinder Construction.

Each row of six cylinders consists of one block casting of aluminium alloy with inserted steel cylinder-liners.

The cylinder-heads are part of the block casting and the steel liners make a plain metal-to-metal joint with the cylinder-head, and a joint packed by a narrow rubber ring with the bottom of the block casting. These liners are very easily removable from, or replaceable within, the block casting so that new liners may be fitted by any competent engine mechanic.

The block casting is held down by seven pairs of long bolts—one pair at each end of the block and one pair between each cylinder. These bolts pass through the head portion of the block casting and run down to the crankcase through aluminium tubes. The lower ends of the steel cylinder-liners are flanged to bear on the crankcase, but the main block casting does not reach to the crankcase. Some form of fibre washer is put over each of the holding down bolts below the bottom of the casting, so that when the holding down bolts are tightened up the cylinder-heads are tightened down onto the barrels, and the barrels onto the crankcase. Explosion loads are thus taken direct from the cylinder-heads through these steel bolts and the lower portion of the block casting carries no working loads and acts as a water container only.

The cylinder-liners are machined from forgings, and are of very simple form. Apart from a flange near the lower end-bearing on the crankcase, three stiffening flanges above this and a narrow checked flange which makes the joint with the cylinder-head, they are plain tubes.



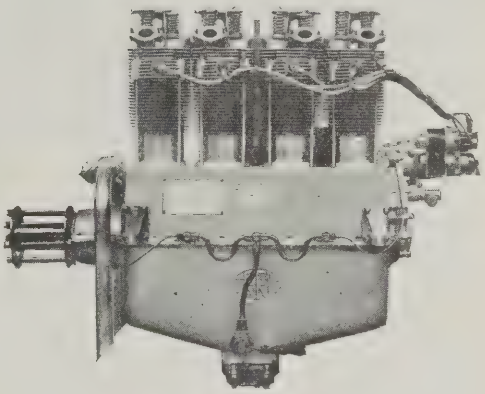
THE ROLLS-ROYCE F.12 ENGINE.—A new twelve-cylinder geared engine, rated at 490 h.p., which is remarkable for its weight, small frontal area and very low fuel consumption.

THE HON. LADY BAILEY FLIES SOLO FROM ENGLAND TO CAPETOWN ON A "CIRRUS" ENGINED "MOTH" LIGHT AEROPLANE

The Hon. Lady Bailey.

"The greatest aerial feat yet performed by a woman."

(Vide Daily Press.)


30/80 h.p. A.D.C. "Cirrus."

Some facts which make this a noteworthy flight:—

(1.) This is the longest flight ever completed by a lady pilot flying her own machine.

(2.) Lady Bailey was flying solo in a "Moth" Light Aeroplane with a "CIRRUS" engine of only 30/80 h.p. on this journey of 8,000 miles across Europe and Africa.

30/80 h.p. "CIRRUS" engines are the only Light Plane engines on which World Flights have been successfully accomplished and they were chosen by:—

Sqdr. Ldr. HINKLER, A.F.C., D.S.M., S.A.A.F.	ENGLAND—AUSTRALIA (16 days)
Capt. W. N. LANCASTER.	ENGLAND—AUSTRALIA (with passenger)
Lt. R. R. BENTLEY, A.F.C., S.A.A.F.	LONDON—CAPETOWN (Solo)
Capt. T. NEVILLE STACK, A.F.C. and B. M. S. LEETE, ESQ., A.F.C.	LONDON—INDIA (Karachi)

and

Capt. H. S. BROAD, A.F.C.	1st KING'S CUP AIR RACE, 1926.
Capt. W. L. HOPE.	1st KING'S CUP AIR RACE, 1927.

Etc., etc.

CIRRUS ENGINES ARE MANUFACTURED BY

HE PIONEERS OF 4-CYL-IN-LINE AIR-COOLED LIGHT AEROPLANE ENGINES.

A.D.C. AIRCRAFT LTD.

phone :
orn 4076.

REGENT HOUSE, KINGSWAY, LONDON, W.C.2.

Telegrams:
Airdisco, London.

The lower section of the block casting is practically a plain rectangular-section box providing for water space round the steel liners. The upper section, in which the valve parts and water passages cooling the head are formed, is a much simpler piece of foundry work than are the majority of modern cylinder-heads.

There are four valves—two inlet and two exhaust—per cylinder. These bear on screwed-in aluminium-bronze seats which can be removed and replaced very easily.

OVERHEAD VALVE GEAR.

There is one overhead camshaft running centrally over each line of cylinders, with a separate cam for each valve. Each cam bears directly on a rocker-arm which is pivoted on the side of the camshaft opposite to that on which the operated valve lies. The camshaft-bearing and the supports for the shafts on which the rockers pivot are carried on duralumin forgings bolted down to the cylinder block casting.

A cast aluminium cover, which is quite independent of the valve-gear supports, encloses the whole of the overhead gear.

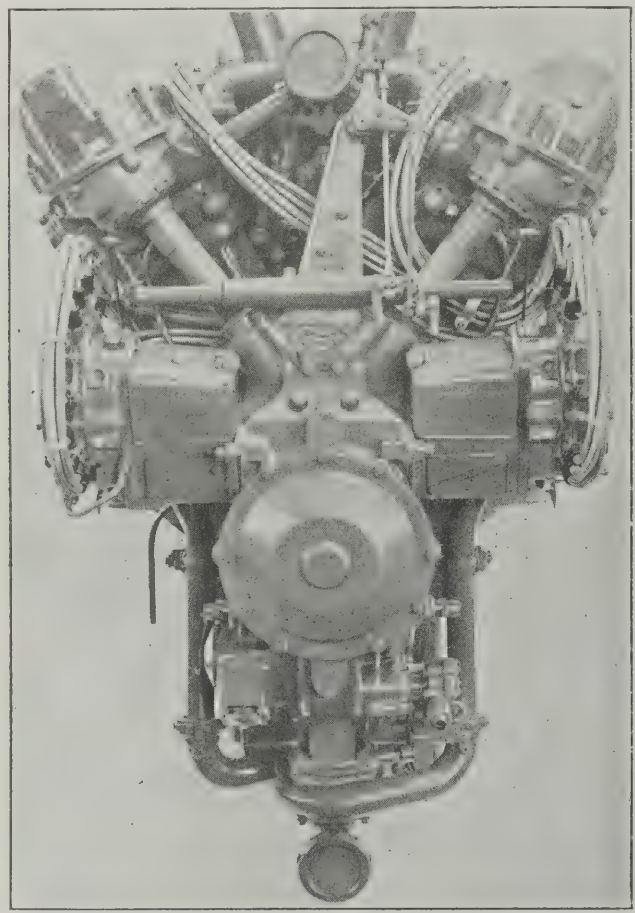
THE CRANKCASE.

The crankcase consists of two castings of aluminium alloy, jointed on a plane somewhat below the crankshaft. The lower casting is essentially an oil retaining case, and the upper carries the whole of the crankshaft bearings.

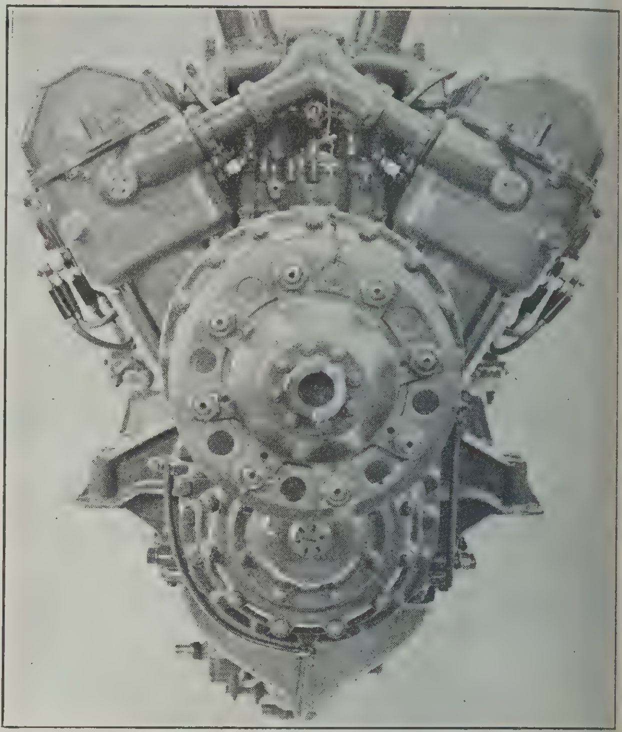
The main crankshaft bearings are divided steel shells, white-metal lined. These bearings are held into the upper part of the crankcase by forged-duralumin bearing caps, fitted between accurately machined facings in the crankcase casting, and held in place not only by normal vertical bolts, but each by two horizontal bolts which pass right across the crankcase and through the bearing-caps. These transverse bolts tie the two sides of the upper part of the crankcase together and serve to give it—quite independently of the lower part—a greatly increased rigidity.

THE CRANKSHAFT.

This is a nickel-chrome steel forging ground all over and lapped to size on all crankpins and journal bearings. Thanks to the close cylinder centres it is relatively short, and as it is throughout of ample diameter it is correspondingly stiff. The shaft is bored throughout and serves in the usual way as an oil passage for the lubrication of connecting-rod bearings.



THE ROLLS-ROYCE F.12 ENGINE.—Gear-end view showing the lay-out of the engine auxiliaries. Above the water pump and to the right is the petrol pump and level with it on the left side is the gun control gear cam-case.



THE ROLLS-ROYCE F.12 ENGINE.—The airscrew end. This view shows how compact the engine is and how the high airscrew centre lends itself to a clean entry to the nose of the fuselage containing it.

CONNECTING RODS.

There is one forked and one plain connecting-rod on each of the six crankpins. The big-end of each forked rod carries a steel block, white-metal lined, which bears on the whole length of each crankpin. Between the two halves of the fork, this block is machined to circular section and is white metal surfaced. The plain rod runs on the central section of this block.

The rods themselves are "H" section, machined from 3½% nickel-steel forgings, and are fitted with floating phosphor-bronze bushes at their little-ends. Each rod is provided with an oil tube which conveys oil under pressure from the big-end bearings to the little-ends.

PISTONS.

Pistons are machined from "Y" alloy forgings, and are fitted with four very narrow rings. Three of these, above the gudgeon-pin, are of the plain type. The remaining one close to the bottom of the piston skirt, is an oil-scraper. Very ample areas of metal are provided for heat flow from piston head to skirt.

The gudgeon-pins—of 5% nickel case-hardening steel—floa in the pistons as well as in the little-end bushes, which in their turn float in the connecting-rod ends.

REDUCTION GEAR.

The reduction gears of both the F.11 and the F.12 type are of the plain spur type. These gears are carried in a case of aluminium alloy bolted to the airscrew end of the crank case.

The pinion is carried on a shaft entirely separate from the crankshaft driven by external splines meshing with interna splines in a flange bolted to the crankshaft. These splines are so designed as to permit of a slight degree of misalignmen between the crankshaft and the pinion shaft, and thus secures that no loads other than pure torsion shall be transmitted from the gear to the crankshaft. Both gears run on roller bearings.

AUXILIARY DRIVES.

All the gears for auxiliary drives are contained in a separate casing bolted to the rear end of the crankcase. The main drive for these gears is taken from the end of the crankshaft by a serrated coupling through a slender shaft which serves as a spring drive, and a friction damper is fitted to the end of this flexible shaft. As a safeguard against failure of this shaft, a second splined coupling, rigidly connected to the gear-drive, is provided in tandem with the first one, but this second coupling is a slightly slack fit in its mate on the crankshaft and normally runs free in it.

If the flexible drive fails the rigid one takes over after taking up a minute amount of play.

The general lay-out of the auxiliary drives follows norma practices.

BY APPOINTMENT TO HIS MAJESTY THE KING

The Greatest World Flight.

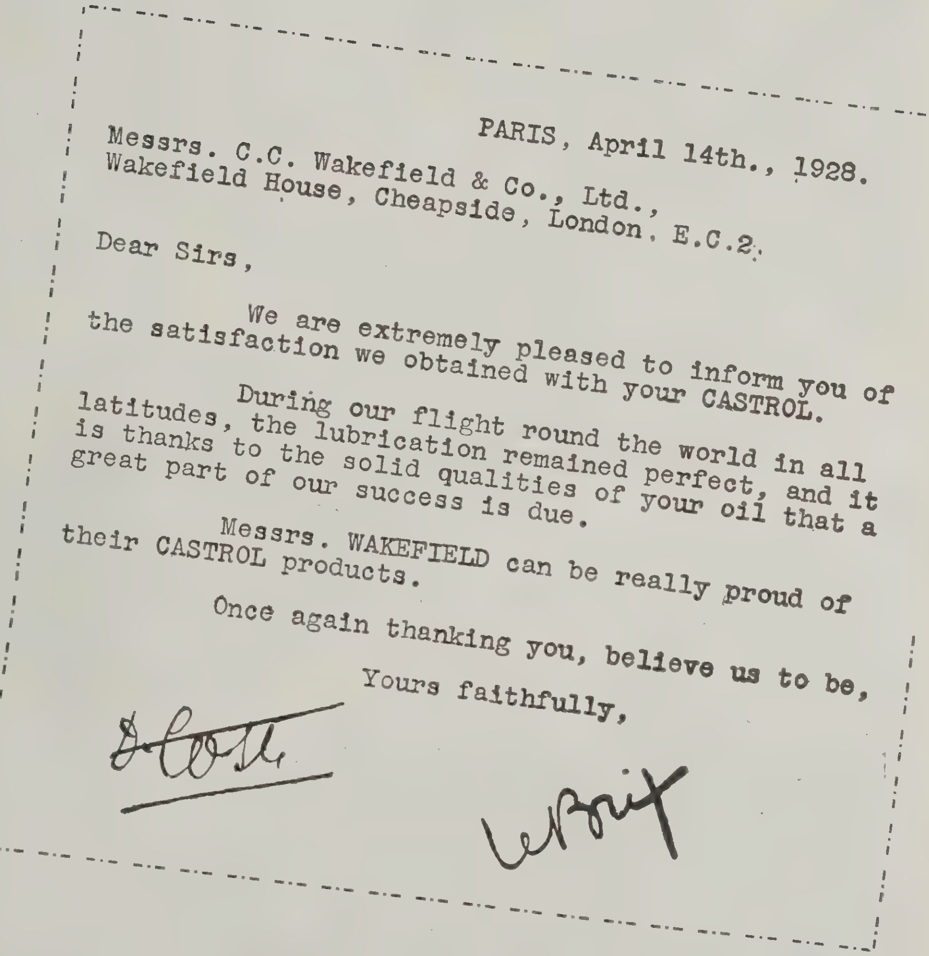
vide "The Aeroplane," 18/4/28.

Capt. Costes and Lieut. le Brix left Paris on October 10th, 1927, flying a Breguet XIX (500 h.p. Hispano-Suiza Engine) and crossed the South Atlantic non-stop from St. Louis, Senegal, to Natal, Brazil, on Oct. 14th to 15th. This was the first mainland to mainland crossing of the South Atlantic, and moreover was made on a single-engined land machine.

Continuing their tour, they flew many thousands of miles in South America, and then in the United States. From San Francisco, they shipped to Tokio, and then returned to Paris in long stages at unprecedented speed.

Leaving Tokio on April 18th, 1921, they reached Hanoi, Tongking the next day. They landed at Calcutta, on April 10th, Karachi on the 11th Aleppo on the 12th, at Athens next day, and reached Le Bourget on April 14th.

Thus, the flight home from Tokio was accomplished in seven days, and in all Messrs. Costes and le Brix covered over 35,000 miles in 330 flying hours—a magnificent performance especially when it is realised that the same engine and machine were used throughout.



PARIS, April 14th., 1928.

Messrs. C.C. Wakefield & Co., Ltd.,
Wakefield House, Cheapside, London, E.C.2.

Dear Sirs,

We are extremely pleased to inform you of the satisfaction we obtained with your CASTROL.

During our flight round the world in all latitudes, the lubrication remained perfect, and it is thanks to the solid qualities of your oil that a great part of our success is due.

Messrs. WAKEFIELD can be really proud of their CASTROL products.

Once again thanking you, believe us to be,

Yours faithfully,

dCoste

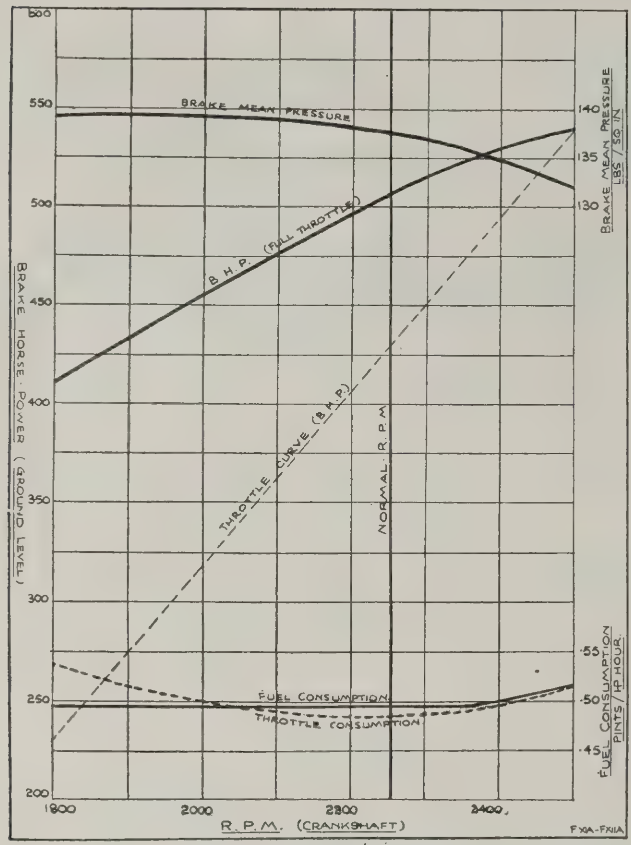
leBrix

All over the World, when only the best will stand the test, all use—

WAKEFIELD Castrol Regd. MOTOR OIL

—the Product of an All-British Firm.

C. WAKEFIELD & CO., LTD., Wakefield House, Cheapside, London, E.C.2



The overhead camshafts are driven from a main bevel-wheel coupled to the crankshaft, through a short vertical shaft and thence through two further sets of bevel-gears and a pair of inclined shafts which are in turn connected to the camshaft by bevels. Two horizontal lay-shafts for the magnetos are driven from the intermediate vertical shaft.

Below the crankshaft and derived ultimately from the same bevel-wheel coupled to the crankshaft, drives are provided for one pressure and two scavenger oil-pumps lodged in the lower half of the crankcase, for the water pump, for a gear-type petrol-pump, and for a gun-synchronising gear.

Lubrication.

Lubrication is on the usual dry-sump system, but the pressure supply to the engine bearings presents one nove feature. High pressure oil from the pressure pump is sup plied direct to all crankshaft and connecting-rod bearings The excess of oil beyond that needed for these bearings i returned to the crankcase through two release valves i series which are set to blow off at different pressures. Fron between the first and second of these release valves oil a reduced pressure is taken to the camshaft and other auxiliar bearings.

Carburation, Ignition, etc.

Two Duplex Rolls-Royce carburettors are fitted betwee the cylinder blocks. These carburettors have an automati altitude-control and sealed float chambers.

Two twelve-cylinder B.T.H. magnetos are fitted trans versely at the rear end of the crankcase. The magneto advance control is interlocked with that of the carburettors

A worm-gear hand-starter with a handle which may b used from either side of the engine is a standard fitting.

Specification of the Rolls-Royce F.11 and F.12 Engines

Bore	5 inches (127 m/m.	
Stroke	5½ inches (140 m/m.	
Compression ratio	6/	
Normal output	490 b.h.p. at 2,250 r.p.m. of crankshaf	
Maximum output	535 b.h.p. at 2,500 r.p.m. of crankshaf	
Weight complete dry	865 lbs. (392 kg.	
Fuel consumption at normal output	30 galls. (136 litres) per hou	
Oil consumption	5 pints (2.84 litres) per hou	
	F.11	F.1
Reduction gear ratio	.632	.55
Normal airscrew r.p.m.	1,421	1,24

A BANQUET TO A PIONEER.

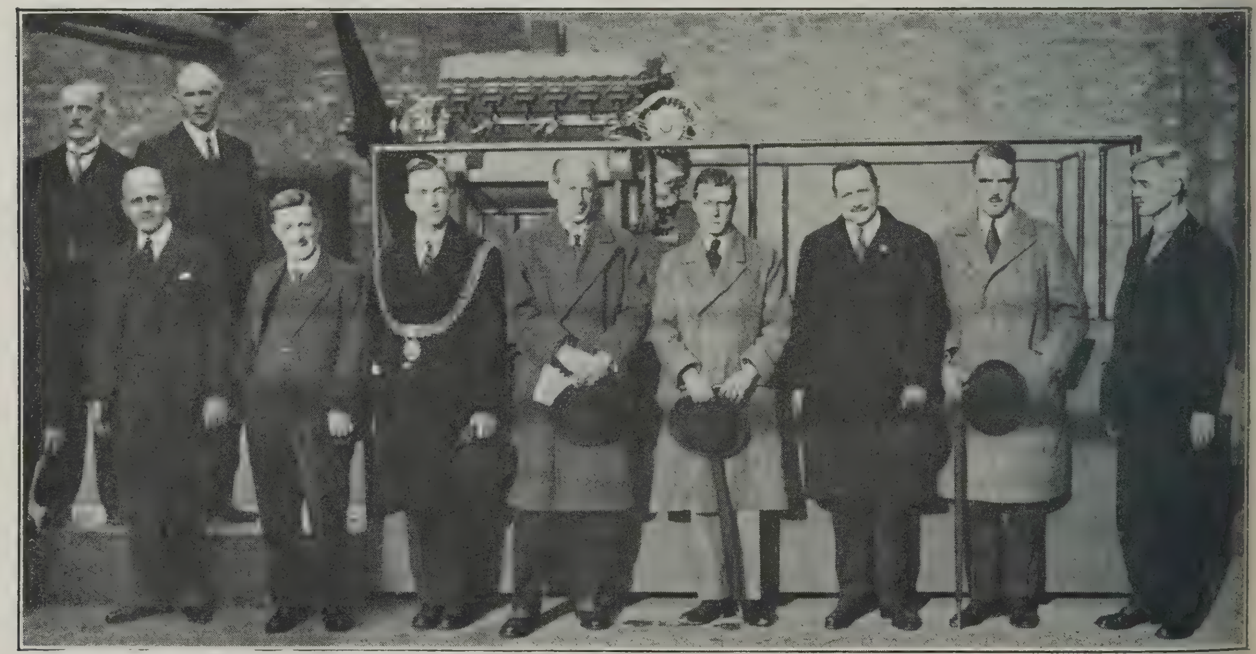
The Royal Aero Club, The Royal Aeronautical Society The Air League of the British Empire, and the Society of British Aircraft Constructors have decided to give Joint Banquet to Mr. A. V. Roe in recognition of his pionee work and the great debt which British Aviation owes to hi during the past twenty years.

The date will be announced later.

THE ROYAL AERONAUTICAL SOCIETY.

Mr. B. M. Wallis, chief engineer of the Airship Guarante Co. Ltd., builders of the 5,000,000 cubic foot airship R.100 will read a paper on "The Design and Construction of Rigi Airships" at a meeting of the Royal Aeronautical Society (with which is incorporated the Institution of Aeronautica Engineers) on Thursday, May 10, at 6.30 p.m., at the room of the Royal Society of Arts, 18, John Street, Adelphi, W.C.2

Sir Alan Anderson, K.B.E., has promised to open the dis cussion.



A ROYAL VISITOR.—A group taken on Feb. 21 on the occasion of the visit of H.R.H. the Prince of Wales to the Rolls-Royce Works at Derby. From left to right: Mr. J. De Looze, F.C.I.S. (Secretary), Mr. A. F. Sidgreaves (General Sales Manager), Mr. Percy Northey, Mr. H. Wormald, O.B.E. (General Works Manager), the Mayor of Derby, Mr. Basil Johnson (Managing Director), H.R.H. the Prince of Wales, Lt.-Col. the Lord Herbert Scott, C.M.G., D.S.O. (Director), the Hon. Bruce Ogilvie (Equerry to the Prince), and Mr. A. S. Rowledge (Assistant Chief Engineer). In the background is the Rolls-Royce F.12 aero-engine.

The efforts of the Société Lorraine ensure steady progress in the value and reliability of Aviation.

Over 5,000 engines are in use all over the World. They are fitted to all types of aircraft, having made themselves indispensable by their regularity of operation. Their use in service has confirmed the brilliant reputation which they have obtained in the number of big flights made during recent years.

SOCIÉTÉ LORRAINE

Works : Argenteuil (S. et O.)

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THE ROYAL AIR FORCE.

The London Gazette.

April 24.

General Duties Branch.—The following are granted S.S. comns. as Plt. Offs. on probation with effect from and with seniority of the dates indicated :—H. P. Wilson (April 2), J. Addison, D. A. L. Campbell, H. H. Chapman, P. Le M. C. Deacon, J. W. Hawke, F. R. Jones, W. H. Jones, H. Kerr, H. D. McGregor, G. F. Macpherson, R. G. Whalley, E. S. Whitaker, H. J. A. Williams (April 13).

The following Plt. Offs. are promoted to the rank of Flg. Off. with effect from the dates indicated :—C. H. Hockly (Nov. 8, 1927), G. Bartholomew, E. L. J. Rowe, V. D. Morshead, M. Griffiths, D. S. King, H. C. D. Hayter, A. K. K. Calwell, F. G. Fairhead (Mar. 18), H. Broadhurst (April 1).

Flg. Off. F. E. Williams Davis is transferred to the Reserve, Class A (April 18); Flg. Off. F. W. M. Matthews resigns his perm. comn. (April 18).

The following Flg. Offs. resign their S.S. comns (April 25) :—J. E. Bolt, G. I. C. Peacocke. The S.S. comns. of the following Plt. Offs. on probation are terminated on cessation of duty (April 25) :—B. E. Brown, F. J. Dunne.

Medical Branch.—P. B. L. Potter, M.B., is granted a S.S. comn. as a Flg. Off. for three years on the Active List with effect from and with seniority of Mar. 28, and is seconded for duty with the Princess Alice Memorial Hospital, Eastbourne, from that date. L. I. Hyder is granted a S.S. comn. as a Flg. Off. for three years on the Active List with effect from Jan. 6, 1926, and with seniority of Jan. 6, 1925 (substituted for the notification in the *Gazette* of Jan. 26, 1926); Flg. Off. L. I. Hyder is promoted to the rank of Flt. Lt. with effect from Jan. 6, 1928, and with seniority of Jan. 6, 1927 (substituted for the notification in the *Gazette* of Jan. 10, 1928); Flt. Lt. T. K. Place is promoted to the rank of Sq. Ldr. (Dental) on promotion to Maj. in the Army Dental Corps (April 14).

Reserve of Air Force Officers.—General Duties Branch.—Flg. Off. F. W. M. Matthews is granted a comn. in Class A in this rank on resignation of his perm. comn. (April 18); E. C. L. Basan is granted a comn. in Class A.A. as Plt. Off. on probation (April 11); Plt. Off. M. T. Bromley is promoted to the rank of Flg. Off. (April 12); Plt Off. on probation R. P. J. Radbourne is confirmed in rank (April 20); Flg. Off. C. R. McMullin is transferred from Class C to Class A (March 31); Flt. Lt. S. C. Harker is transferred from Class A to Class C (Feb. 19); Plt. Off. H. P. Wilson resigns his comn. in the Special Reserve on appointment to a S.S. comn. (April 2).

Medical Branch.—Flt. Lt. L. Game ceases to be employed with the Regular Air Force (April 21).

Auxiliary Air Force.—General Duties Branch.—No. 601 County of London (Bombing) Squadron.—The following to be Flg. Off. :—R. G. Shaw, D.F.C. (Mar. 26). No. 602 City of Glasgow (Bombing) Squadron.—The following to be Plt. Off. :—J. K. Horsburgh (Mar. 14).

Princess Mary's R.A.F. Nursing Service.—Matron Miss C. Cameron, R.R.C., is placed on the retired list (April 6).

Appointments.

Week ending April 30.

General Duties Branch.—Wing Commander A. J. Miley, O.B.E., to H.Q., Coastal Area, for Air Staff duties, 1/5.

Squadron Leaders E. O. Grenfell, M.C., D.F.C., A.F.C., to No. 1 Sqdn., Tangmere, 19/3. W. Sowrey, D.F.C., A.F.C., to R.A.F. Practice Camp, Sutton Bridge, 8/4. C. H. Elliott-Smith, A.F.C., to No. 504 Sqdn., Hucknall, 23/4.

Flight Lieutenants G. R. O'Sullivan, to School of Naval Co-operation, Lee-on-Solent, 27/4. A. G. Thackray, to No. 9 Sqdn., Manston, 26/4. L. W. Jarvis, to R.A.F. Depot, Uxbridge, 12/4. W. M. M. Hurley, to No. 4 F.T.S., Egypt, 22/3. A. McR. Moffatt, to R.A.F. Practice Camp, North Coates Fitties, 29/3. E. D. Davis, to R.A.F. Practice Camp, Weston Zoyland, 4/4. R. E. Meek, to No. 13 Sqdn., Andover, 18/4. R. H. Haworth-Booth, D.F.C., to No. 504 Sqdn., Hucknall, 26/3.

Flying Officers R. A. Whyte, to R.A.F. Practice Camp, North Coates Fitties, 14/4. C. J. Stone, to R.A.F. Practice Camp, Weston Zoyland, 29/3. A. E. Haes, to R.A.F. Practice Camp, Weston Zoyland, 13/4. I. W. C. Mackenzie, to R.A.F. Practice Camp, Sutton Bridge, 14/4. C. H. Roberts, to R.A.F. Practice Camp, Sutton Bridge, 29/3. A. W. H. Nelson, to R.A.F. Practice Camp, North Coates Fitties, 29/3. N. Liddall, to R.A.F. Depot, Uxbridge, 12/4. F. G. S. Wilson, to R.A.F. Depot, Uxbridge, 3/3. D. Robinson, to No. 24 Sqdn., Northolt, 1/5.

Pilot Officers J. Barton, to No. 7 Sqdn., Worthy Down, 21/4. E. L. Johnstone, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn., 19/4. M. N. Oxford, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn., 20/4.

Medical Branch.—Squadron Leader P. H. Young, M.B., to R.A.F. General Hospital, 'Iraq, 25/3. Squadron Leader (Dental) T. K. Place, to R.A.F. General Hospital, 'Iraq, 7/4.

Flight Lieutenant J. G. Russell, M.B., B.A., to R.A.F. Depot, Uxbridge, 12/4.

Flying Officers G. W. McAleer, M.B., L. Freeman and W. Heron, M.B., to R.A.F. General Hospital, 'Iraq, 25/3. E. P. Carroll and J. F. McGovern, M.B., to R.A.F. Combined Hospital, 'Iraq, 27/3.

Stores Branch.—Flying Officer H. J. Hunter, to R.A.F. Base, Gosport, 26/4.

Accountant Branch.—Squadron Leader C. C. J. Croydon, to Electrical and Wireless School, Flowerdown, 2/5.

Chaplains Branch.—The Rev. G. L. Robinson, D.S.O., to Record Office, Ruislip, 12/4.

Service Air Transport for the Prince of Wales.

Group Captain H.R.H. the Prince of Wales, K.G., visited the R.A.F. Station at Northolt on April 27 and made a passenger flight in a Service Bristol Fighter fitted with slotted wings. A machine of this type will in future be maintained at Northolt for the use of His Royal Highness when circumstances may make it necessary for him to use one.

The Higher Command.

The Air Ministry announces the following appointments :—

Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., to be Air Officer Commanding-in-Chief, Air Defence of Great Britain (temporary), during the absence in Australia of Air Marshal Sir J. M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O., A.D.C., to date May 26, 1928.

Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O., to be Air Officer-Commanding, Coastal Area, vice Air Vice-Marshal Scarlett, to date May 26, 1928.

Air Vice-Marshal Scarlett.

Air Vice-Marshal F. R. Scarlett, C.B., D.S.O., whose appointment to be Air Officer Commanding-in-Chief Air Defence of Great Britain (temporary) during the absence in Australia of Air Marshal Sir John Salmond, is to date from

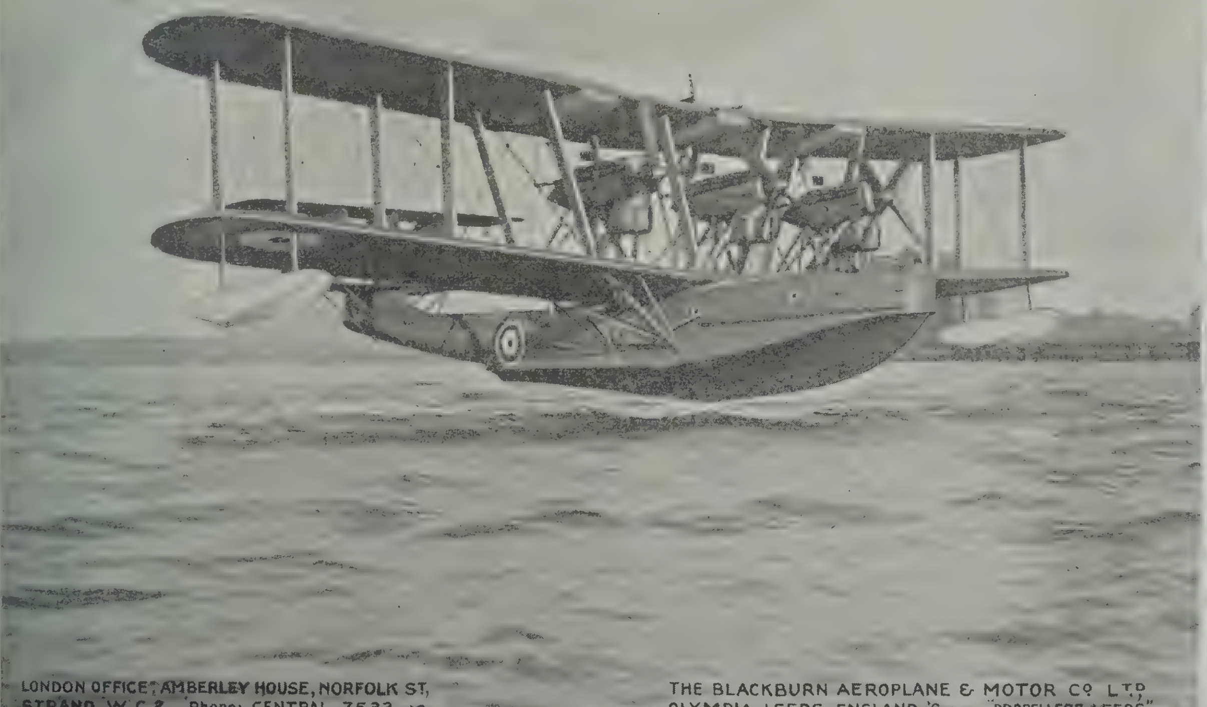
A NILE PATROL.—A formation of D.H.9as of No. 47 (Bombing) Squadron, R.A.F., flying over the Blue Nile Bridge. No. 47 (Bombing) Squadron has since been re-equipped with Fairey III.Fs. —*(R.A.F. Official photograph.)*

Blackburn
IRIS

SEAWORTHINESS

During the gale which raged on the East Coast early last January, the IRIS was moored out at sea. So fierce was this gale that it caused the flying boat to drag her mooring stone a considerable distance. Her hull was dented by the fury of the storm, & at one time it was thought that she would be wrecked.

She was flying the following day her AIRWORTHINESS being completely unimpaired.



LONDON OFFICE: AMBERLEY HOUSE, NORFOLK ST, STRAND. W.C.2. Phone: CENTRAL 7522

THE BLACKBURN AEROPLANE & MOTOR Co. LTD.
OLYMPIA, LEEDS, ENGLAND. Grams: "PROPELLERS, LEEDS."

B 37

May 26, was born in 1875 and entered the Royal Navy as a Cadet in 1891. He learned to fly on a Maurice-Farman biplane at Upavon and his Royal Aero Club Certificate No. 468 is dated April 24, 1913. In December, 1913, he was appointed Inspecting Captain of Aircraft in the Naval Wing of the R.F.C. During the War 1914-18 he served with the R.N.A.S. in the Mediterranean and at the Dardanelles. In 1917 he was made a Companion of the Distinguished Service Order for service in reconnaissance and bombing flights in the Eastern Mediterranean. On the formation of the R.A.F. he was appointed Director of the Air Division at the Admiralty with the temporary rank of Brigadier-General. In January, 1919, he was made a companion of the Order of the Bath, and in August, 1919, he was appointed to a permanent commission in the R.A.F. with the rank of Air Commodore. In December, 1919, he assumed command of the R.A.F., Halton. He was promoted to the rank of Air Vice-Marshal in January, 1924, and in September, 1924, he was appointed Air Officer Commanding Coastal Area, R.A.F.

Air Vice-Marshal Lambe.

Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O., whose appointment to be Air Officer Commanding, Coastal Area, R.A.F., is to date May 26, was born in 1875 and entered the Royal Navy in 1891. He served with the Benin Expedition of 1897 and was promoted Commander, R.N., in 1908. In August, 1914, he was appointed Wing Commander, R.N.A.S., while in command of H.M.S. *Hermes*. He learned to fly on a Maurice-Farman biplane at Chingford and his Royal Aero Club certificate No. 1284 is dated May 29, 1915.

In 1915 he was appointed to command the air patrols at Dover and Dunkirk a unit which later became the Fifth Group under the same command. In 1916 he was appointed to be a Companion of the Distinguished Service Order "for his valuable services in command of the R.N.A.S. units on the Belgian coast; he is very largely responsible for the good service in the varied duties carried out by them against the enemy." On Jan. 1, 1918, he was made a Companion of the Order of St. Michael and St. George, and in June, 1919, he was made a Companion of the Order of the Bath. In August, 1919, he was appointed to a permanent commission in the R.A.F. with the rank of Air Commodore and posted to the Air Ministry as Director of Equipment. In February, 1924, he was appointed Air Officer Commanding R.A.F., Halton, and in January, 1925, he was promoted to the rank of Air Vice-Marshal.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Attock, India, to a D.H.9a machine of No. 27 (Bombing) Sqdn., Risalpur, on April 25, 362706 L-AC. Ernest Arthur Turner, the passenger, was drowned. 362014 Sjt. David Irving, the pilot of the aircraft, was uninjured.

The Air Ministry regrets to announce that as the result of an accident at Cranwell to a Siskin machine of the R.A.F. Cadet College, Cranwell, on April 26 Flight Cadet Peter Anthony Meakin, the pilot and sole occupant of the aircraft, sustained injuries from which he died in hospital on the following day.

The 1928 Cairo—Cape Town Flight.

The annual Service flight under the command of Air Vice-Marshal T. I. Webb-Bowen, C.B., C.M.G., which left Heliopolis on Mar. 1 and reached Cape Town on Mar. 24, arrived at Khartum on the return journey on April 24 accompanied by a unit of the South African Air Force.

A Service Flight to North Africa.

Wing Cdr. J. R. H. Smyth-Pigott, D.S.O., R.A.F., Air Attaché to the British Embassy in Paris, left Eastchurch Aerodrome on April 28 to fly to North Africa on a visit to the French Air Units. Wing Cdr. Smyth-Pigott is flying a Service D.H. Moth. He landed at Avord, in the Cher Department of France, in the afternoon of April 28.

The R. M. Groves Aeronautical Research Prize

The R. M. Groves Aeronautical Research Prize for 1927 has been awarded to Flt. Lt. N. Comper, Marine Aircraft Experimental Establishment, R.A.F., Felixstowe.

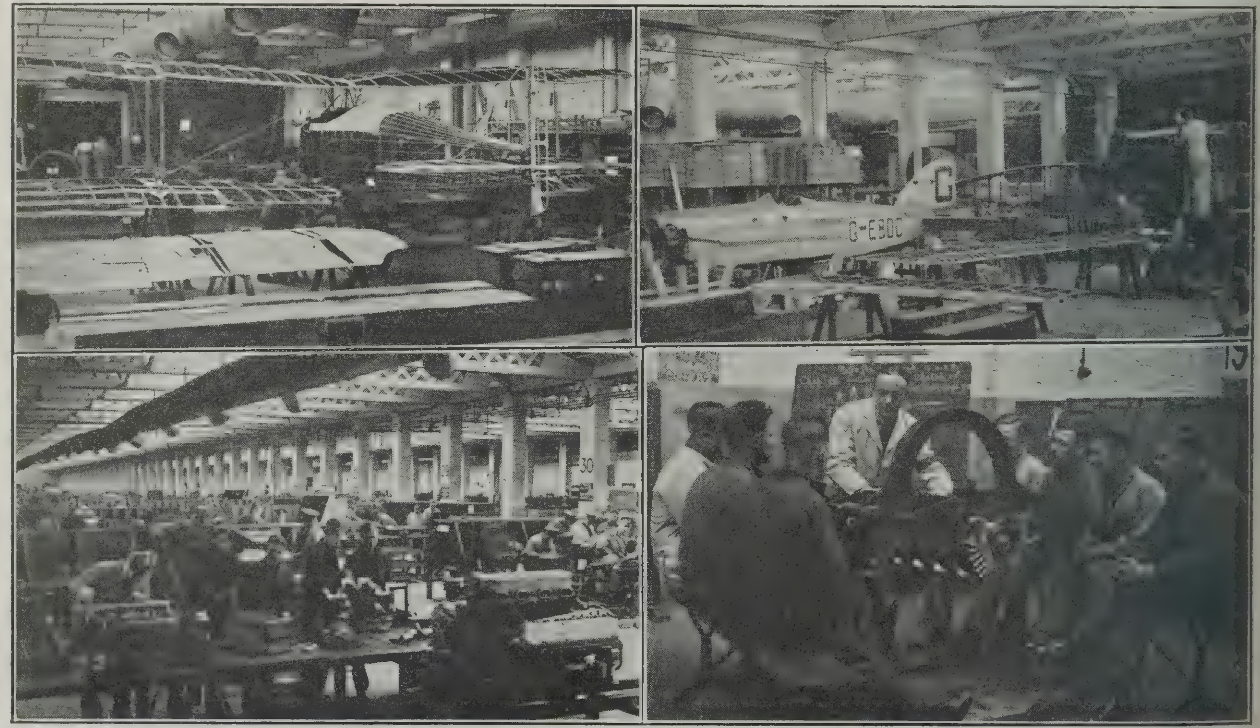
The Training of Aircraft Apprentices.

The present system of training Aircraft Apprentices in the R.A.F. which began in 1920, is, like the R.A.F. itself, largely of an experimental nature and subject to amendments and improvements. The system whereby a number of the best Apprentices, apart from those who obtain Cadetships, pass out of the Technical Training Schools at Halton and Flowerdown with the rank of Corporal after a nine weeks' course of extra training as N.C.O.'s has been discontinued and will take effect when the last entry under the old system passes out at the end of this year.

ADMINISTRATION.

The total strength of Aircraft Apprentices in the R.A.F. is about 3,000 of which roughly 2,600 are at Halton and 400 at the Electrical and Wireless School at Flowerdown.

No. 2 School of Technical Training (Apprentices), Halton, is divided for administrative purposes into Station Administration, an Administrative Section, a Training Flight, three Apprentices' Wings and an Education Section. Each Ap-



TECHNICAL TRAINING IN THE R.A.F.—At the top are two views of the Carpenters' shop, the one on the left showing an almost completed Grebe made of condemned timber which is one of the exercises of each course. On the right is the fuselage of the Halton Aero Club's machine, which, after winning a number of prizes in open competitions and races for light aeroplanes, is being made into a monoplane. Below on the left is a view of the Fitters' (aero-engine) shop and on the right one of the small classes undergoing practical instruction.

(*"Aeroplane" photographs.*)

JUPITER VII. (Ungeared, high altitude, gear-driven, supercharger.)

Power at 12,000 ft. :—425 at 1,775, 465 at 1,950 with 80/20 fuel.
Weight:—760 lbs. bare, 810 lbs. complete, ready to fly.

JUPITER VIII. (Geared 2 to 1, high altitude, 5.8 compression ratio,)

Power at 3,000 ft. :—455 at 2,000, 500 at 2,200 with 80/20 fuel.
Equivalent Ground Level Power:—570 at 2,200 with 50/50 fuel.
Weight:—880 lbs. bare, 940 lbs. complete, ready to fly.

JUPITER IX. (Geared 2 to 1, general service, 5·3 compression ratio.)

Power at Ground Level:—485 at 2,000, 525 at 2,200 with 80/20 fuel.
Weight:—880 lbs. bare, 950 lbs. complete, ready to fly.

JUPITER XI. (Geared 2 to 1, commercial, 5.1 compression ratio.)

Power at Ground Level:—460 at 2,000, 500 at 2,200 with aviation fuel.
Weight:—880 lbs. bare, 950 lbs. complete, ready to fly.

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prentices' Wing is divided into three Squadrons and it is these three Squadrons of each Wing which are distinguished by the different coloured hat-bands of the personnel. The whole School plus Headquarters, Halton, and the R.A.F. Hospital, Halton, are under the command of the A.O.C., Halton, Air Commodore I. M. Bonham-Carter, C.B., O.B.E.

The apprentices enter the Schools between the ages of 15 and 16 and are under training for a period of three years. During this time two-thirds of their working hours are spent in the workshops and one-third in the Educational Section.

Education.

The Educational Section which is in charge of Lieut.-Col. A. F. S. Caldwell, D.S.O., M.A., Principal Education Officer, assisted by a staff of Civilian Education Officers, has for its object what the Chief of the Air Staff called "the creation of a new moral." The general education of Aircraft Apprentices is based on the formation of a clear understanding of their work rather than on mere memory tests.

Scientific subjects are only taught as they apply to the aeroplane but two hours a week are devoted to general education which includes such subjects as the evolution of man, the organisation and administration of the British Empire, racial and colour questions, the motives of colonisation, Imperial defence and the history of flying. There are twelve libraries and 200,000 books on the station. The cost of the education of each apprentice has been worked out at £11 15s. a year.

The education building is divided into lecture rooms, large and small class-rooms, and laboratories. In the laboratories there are electric furnaces for the practical demonstration of heat treatment and various other contrivances for giving practical demonstrations of the subjects under consideration, including a machine, invented at Halton, for measuring the pull of an airscrew. To avoid unnecessary expense all heavy laboratory equipment is kept in a store and issued to the different laboratories as required. Among other interesting things is a museum of the ores of all the metals used in aircraft construction and repair. In the engine laboratory is a model of a Zenith carburettor showing the whole of the inside of it through glass.

The Workshops.

The training workshops are divided into the various trades taught and sub-divided into sections according to the first, second, or third year of training. The major trades are fitters (aero-engine) and carpenter riggers, but the latter are gradually being replaced by metal riggers. The minor trades are fitters (driver, petrol), coppersmith and motor-body builders.

In the fitters (aero-engine) shops the apprentices spend most of their first year in learning the use of their tools and complete certain exercises in various metals which include making certain simple tools which they will use in their work. At the end of this year they have elementary instruction on the internal-combustion engine. P. and M. engines are used for this purpose. In the second year they strip, make drawings of, and re-assemble various types of aero-engines. Each engine when re-assembled is fitted into a fuselage, taken to the test shed and run-up. The turning shop which was formerly a separate section is now being dismantled and turning will be part of the general instruction in future.

In the third year the apprentices learn the repair of numerous types of engines and practise the running and fitting of bearings, etc. They all work from blue-prints.

The carpenter-riggers and metal-riggers also start by learning to use their tools and after completing certain exercises, many of which will be extremely valuable to them if they become joiners on their return to civil life, start making struts and spars from blue-prints having first made their own templates. Each entry builds three complete machines of different types from condemned timber and metal parts salvaged from crashed aircraft. Wire-splicing is also taught in this shop.

The fitters (driver-petrol) spend their three years on the construction and repair of the various types of ground transport in use in the R.A.F. and also learn to drive these vehicles in the local lanes and bye-ways.

The coppersmiths and sheet metal-workers also stay at their trade throughout their training and learn to make and mend in all the sheet-metals they are likely to have to handle. There are only about 60 apprentices learning this trade.

The smallest trade is the body-builders of whom there are only eight. They learn the constuction and repair of the body work of ground transport.

At the end of his final year every apprentice spends three weeks at the aerodrome learning the handling, cleaning and maintenance of aircraft. Each aerodrome course averages about 160 and it is during this period that each apprentice is taken for a flight as a passenger. Additional flights are given for exceptionally good behaviour or as a reward for work of special distinction. The machines at the aerodrome include D.H.9as, Bristol Fighters, Lynx Avros, and D.H. Moths. A Fairey III.D and two Siskins are to be added to the equipment.

Barracks.

The apprentices are housed by Wings in separate blocks of barracks. Each Wing has its own dining halls and well-equipped electric-powered kitchen. The very adequate and varied diet-sheet for the week posted on the wall of the kitchen showed the entire absence of that mainstay of military cooking, the rissole. Each Wing has also a separate N.A.A.F.I. building with canteen, billiard and card room, reading and writing room, and library.

Each Wing has its own Band and the apprentices march by Wings with their Bands between the barracks and workshops.

The Gymnasium and Church of England Church are under one roof and separated by folding doors and by an ingenious arrangement the raised flooring which serves both for Church services and big boxing tournaments can be lifted by sections by the apprentices themselves and turned round to face either the Church or the boxing-ring.

Halton has also a magnificent swimming bath in charge of a first-class swimming instructor. The water is aerated and kept at about 68° by a special apparatus and has only to be changed every six months. The bath is 100 feet by 40 feet and as many as 700 apprentices go into it during an evening.—C. M. McA.

R.A.F. SPORTS AND PASTIMES.

The Inter-Service Cross-Country Championship was held at Aldershot on April 24, over a stiff course $7\frac{1}{2}$ miles long, and was won by the Army by eight points, their score being 39 points. The R.A.F. were second with 46 points, and the Navy third with 86 points.

Cpl. S. Ferris, R.A.F., was the first man home in 42 mins. 51 secs.

INTER-SERVICE CHAMPIONS.—The Henlow (R.A.F.) Boxing Team, which won the Sassoon Cup for 1928 by beating the Royal Corps of Signals, the Champion Army Team, by 23 points to 19. The names are, from left to right, seated: AC. Maher (Feather), AC. Winslade (Fly), Sq. Ldr. A. E. Pettingell, Secretary of the R.A.F. Boxing Association, L-AC. Williamson (Feather), AC. Garrett (Light); standing: Cpl. Robinson, Recorder, AC. Lowater (Welter), Flg. Off. Tattersall (Heavy), AC. McGinn (Welter), L-AC. Tate (Light), Mike Honeyman, Trainer, AC. Watts (Light-heavy), AC. Munkley (Heavy), Flg. Off. Colquhoun (Welter), Flg. Off. Brookes (Light). L-AC. Wood and AC. Johnson were absent receiving medical attention.

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G. THARRATT.

DR. DORNIER ON FLYING-BOATS.

The paper by Dr. Dornier entitled "Notes on a Family of Similar Flying-Boats," read before the Royal Aeronautical Society on April 26, provided one of the most stimulating meetings that this Society has recently held.

The paper consisted of an analysis of the weight details of a series of five flying-boats, all of Dornier design and construction, and the deduction from this data of certain conclusions as to the effect of size on the range and performance of machines of this class.

The five boats in question were: (A) The Libelle (80 h.p. Siemens-Halske engine), (B) the Do.E. (Jupiter Series IV engine), (C) the Wal (two Jupiter Series IV engines), (D) the Super-Wal (four Jupiter Series VI engines), and (E) a new Giant boat with twelve Jupiter VI engines now being built by Dr. Dornier.

All these machines are of very similar design and construction. All have the Dornier "stub-wings" on the hulls for lateral balance on the water. All have semi-cantilever wings, and in each case engines are mounted above the wing. Where more than one engine is fitted, the engines are arranged in pairs in tandem, one of each pair driving a tractor and the other a pusher airscrew. There are minor differences of construction. The Libelle has folding wings and all-metal covering. The others have fixed wings and are only partially metal-covered. The three smaller boats have no longitudinal members in the hull, the two larger have. But in general they are of very similar design.

Unfortunately the detailed figures of weights for this family of boats were not printed in the advance copies issued before the lecture, and were only shown in tabulated form as lantern slides at the meeting. There were so many of these figures that it was not possible to follow them in detail.

The main conclusion drawn from these figures by Dr. Dornier is that the tare weight—that is the weight of the machine ready for flight and including essential navigating, etc., instruments, but without special equipment for passengers, etc.—is a percentage of total weight which increases fairly rapidly with size in the smaller sizes, but only very slowly in the larger sizes.

The relative weight of special equipment—cabins and furniture, etc.—of crew, and of many other items, becomes rapidly less important as size increases.

Consequently the total disposable load (fuel and pay load) increases very rapidly with size, and there is a slow increase in range and a very rapid increase in pay load with very large machines of this class.

For example, according to Dr. Dornier the three smaller boats (Libelle, Do.E. and Wal) cannot carry any pay load with fuel for 1,500 km. (930 miles). With this range the Super-Wal can carry 2,250 kg. (4,950 lbs.) and the "Giant" 14,400 kg. (31,680 lbs.) of pay load.

Seaworthiness—which the lecturer said was at least as important a quality as carrying capacity and performance—is a quality very different to define. But he thought the larger machines were more seaworthy than the smaller, particularly because of the increased water clearance of airscrews and engines. At the Warnemünde Seaplane Competition in 1926 a boat of the Do.E. type had a wave break over her engine which filled the carburettor with water just as she was about to take off. This carburettor was 2.5 m. (8 ft.) above water line. Carburettors on the "Giant" would be 7.8 m. (25 ft. 6 in.) above water, and its airscrews would have 6.45 m. (21 ft.) water clearance, so should be safe from such mishaps.

The conclusions drawn by the author are of course contrary to all those deductions from the theory of structures which suggest that as the size of aircraft increases the weight of the structure must increase at an accelerating rate so that at some size not far beyond that already attained the margin of disposable load will disappear altogether. Owing to the fact that no one in the audience had Dr. Dornier's detailed figures of weights the discussion which followed the reading of the paper did not deal with this aspect, though it will certainly be discussed when the figures are available. All those who spoke expressed their gratitude to the author for presenting so detailed a statement on so interesting a subject, but mostly excused themselves from detailed criticism on these grounds.

A number of questions were, however, asked, and to these Dr. Dornier replied as follows:—

The predicted performance of the giant boat was not based on the use of a very greatly increased wing-loading. This machine carried only about 10% heavier loading than the Super-Wal. He was no friend to high-wing loading, but it had to be faced in order to get speed plus load-capacity.

Tandem airscrews did involve a loss of airscrew efficiency, but in his experience the advantages of the arrangement outweighed this loss. It was also true that they found rather more trouble with the pusher than with the tractor airscrews getting damaged by water.

They had not so far had trouble with the cooling of air-cooled radials running as pushers. But their experience so far was confined to the Jupiter IV except that they had run Jupiter VI's in winter without trouble.

He used H.T. steel for spars because he personally preferred that material for that purpose to duralumin. He could not explain that preference.

He used monoplanes because having fewer parts they were cheaper to build than biplanes. Also for seaplanes the lower wing of a biplane was too near the water.

The reason he did not completely cover all his wings with metal was that fabric was lighter and for the most part just as good. There had been a fashion in Germany which demanded all-metal machines, including the covering, and they had been forced to try and comply with the fashion. But the sacrifice in weight in very large machines was too great to be made.

THE DORNIER GIANT FLYING-BOAT.

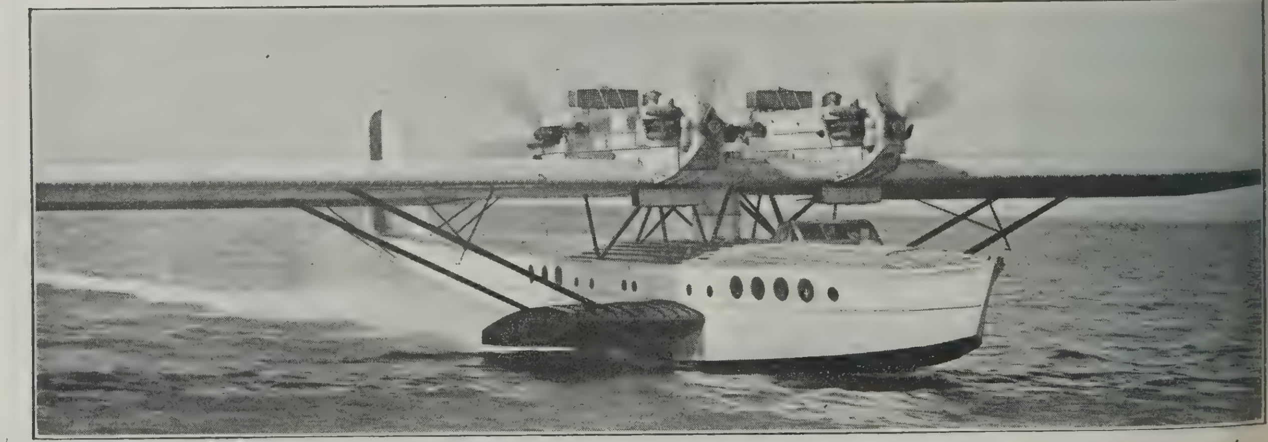
The paper above provides for the first time authentic information as to the enormous flying-boat which is now being built at the Dornier Works. The paper does not give any detailed description of this machine, but the following information has been extracted from it.

The new machine is precisely similar in general arrangement to the Super-Wal. The hull is of relatively large beam and is fitted with stub-wing balancers such as are used on all Dornier boats.

The wing is mounted above the hull and is supported by struts running up from the stub-wings. The wing construction differs from that of earlier Dornier boats in that more than two spars—of H.T. steel—are used. Also the wing is in three sections, a nose and a central section, both duralumin-covered, and a trailing edge which is fabric-covered. The metal covering is not permanently fixed to ribs or spars, but is in the form of stiff panels easily detachable.

Six pairs of engines in tandem are mounted, three on each side, above the wings.

The machine has a wing area of 465 sq. metres (5,000 sq ft.), the designed loaded weight is about 45,000 kg. (100,000 lbs.) and carrying fuel for 1,000 km. the estimated useful load of the machine is 19,738 kg. (43,500 lbs.).



A REAL FLYING-BOAT.—The latest Dornier Superwal (four 450 h.p. Napier Lion engines) undergoing test at Friedrichshafen. With normal full load of 12,000 kgs., a speed of 135 m.p.h. is claimed.

WESTLAND

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THE DETROIT ALL-AMERICAN AIRCRAFT SHOW.

Between April 14 and 21 there was held at Detroit, Mich., an All-American Aircraft Show. Exhibitors included more than 130 manufacturers, dealers, accessory makers, schools and other commercial enterprises concerned with American aeronautics and apart from a number of historical and service aircraft exhibited by Government Departments there were on exhibition over 70 specimens of modern American aircraft, only two of which were of a military type.

The historical aircraft exhibited were an early Bleriot monoplane of 1919 vintage which emanated from Mr. Henry Ford's private museum, the three-engined Fokker "Josephine Ford" which flew over the Polar regions in 1926, the Stinson monoplane "Pride of Detroit" on which Mr. Brock and Mr. Schlee flew from Newfoundland to Tokyo in 1927, and a model of the first Wright biplane.

Aircraft.

Of the modern aircraft exhibited these are dealt with below in alphabetical order.

Advance Aircraft Company, Troy, Ohio.—This company showed five Waco 10 biplanes of their standard three-seat open-cockpit type which can be fitted with four standard types of engines. Of the types shown one had the 125 h.p. Ryan-Siemens, one the 225 h.p. Wright Whirlwind, one the Fairchild Caminez and two the 90 h.p. Curtiss OX-5 engine. One of the latter was fitted with a pair of Edo all-metal floats.

The Aero Craft Manufacturing Co. Inc., Detroit, Mich.—This firm showed their new Aero-Coupé, a three-seat semi-cabin biplane fitted with a 120 h.p. Warner air-cooled radial engine. The cabin portion of this machine can be converted into an open cockpit and dual control is installed making it easily convertible from a commercial to a school aircraft.

The Alexander Aircraft Co., Denver, Colo.—The Alexander Co. showed three three-seater open-cockpit Eaglerock biplanes, one fitted with the 120 h.p. Ryan-Siemens, one with the 225 h.p. Wright Whirlwind and one with the 260 h.p. Menasco-Salmson engine. The Whirlwind-engined machine was equipped as a seaplane.

The American Eagle Aircraft Co., Kansas City, Mo.—This company showed two three-seater open-cockpit biplanes, one with the 90 h.p. Curtiss OX-5 and one with a radial engine.

The Atlantic Aircraft Corporation, Hasbrouck Heights, N.J.—This company showed the new Fokker Super-Universal fitted with the 400 h.p. Pratt and Whitney Wasp engine. This machine differs from the original Universal in that the wing is now a full cantilever with the undercarriage compression struts carried straight up to the front main spar of the wing. Besides the operating crew there is comfortable cabin accommodation for five or six passengers.

The Bellanca Aircraft Corpn., Wilmington, Delaware.—This corporation showed the latest Bellanca type CH monoplane fitted with the Whirlwind engine which is a refined version of the machine used by Mr. Chamberlin on his flight from New York to Eisleben, Germany, in 1927. It is fitted with a new type cantilever undercarriage, wheel brakes, dual control, and hand inertia engine starter.

The Berliner Aircraft Co. Inc., Alexandria, Va.—There is no information available concerning the new machine exhibited by this company, beyond the fact that it was an open-cockpit monoplane with a Whirlwind engine.

The Buhl Aircraft Co., Marysville, Mich.—The Buhl Company showed the Buhl Airsedan (Wright Whirlwind engine) five-seater cabin biplane. This machine was described in The Aeroplane on Dec. 7, 1927.

The Cessna Aircraft Co., Wichita, Kansas.—This company showed the Cessna four-seater cabin cantilever monoplane fitted with the Wright Whirlwind engine.

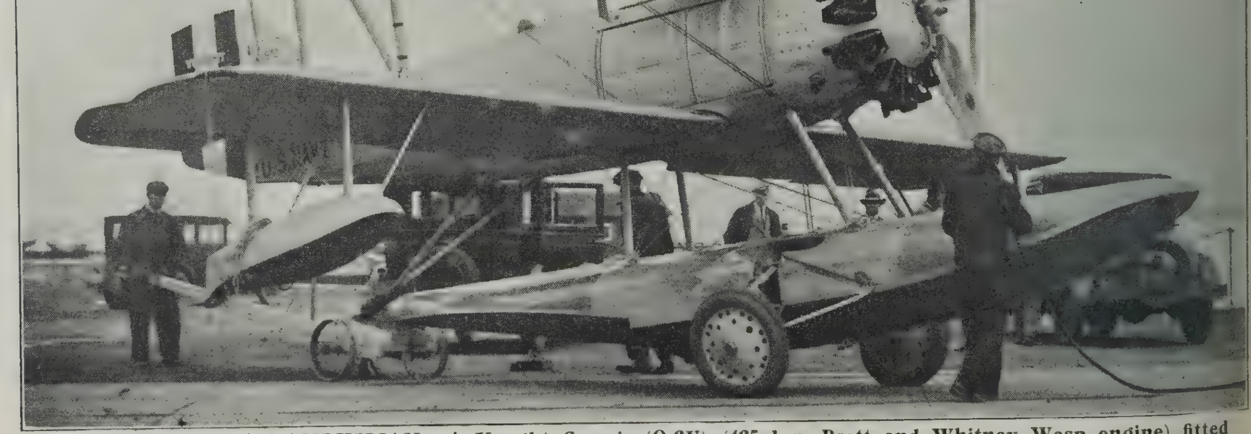
The Chicago Aviation Company, Chicago, Ill.—This firm exhibited the new production of the Viking Aircraft Co., of 745, South Clark Street, Chicago. This machine is a braced monoplane fitted with a 120 h.p. Anzani engine and has accommodation for three passengers and pilot.

The Driggs Aircraft Corporation, Lansing, Mich.—The Driggs Aircraft Corporation exhibited the Driggs Dart two-seat light biplane fitted with a 70 h.p. Anzani engine. This machine is a very neat little tractor biplane of perfect proportions. It has a welded steel-tube fuselage, wooden wings of unequal span, Warren-type wing bracing, and a divided undercarriage.

J. H. Eastman, Detroit, Mich.—Mr. J. H. Eastman shows a small two-seat side-by-side tractor short-hulled flying-boat fitted with a radial engine of about 70 h.p. The hull is of metal and the tail unit is carried on booms, two from the top plane and two from the heel of the boat hull. The wings are of unequal span and chord and in addition to two "N" type interplane struts, one on either side of the hull, the top plane is braced to the hull by two "V" type struts, one on either side. The engine is carried in a streamline nacelle in the centre of the top wing and is braced to the hull by four struts. The cockpit, fitted with dual control is situated under the top wing.

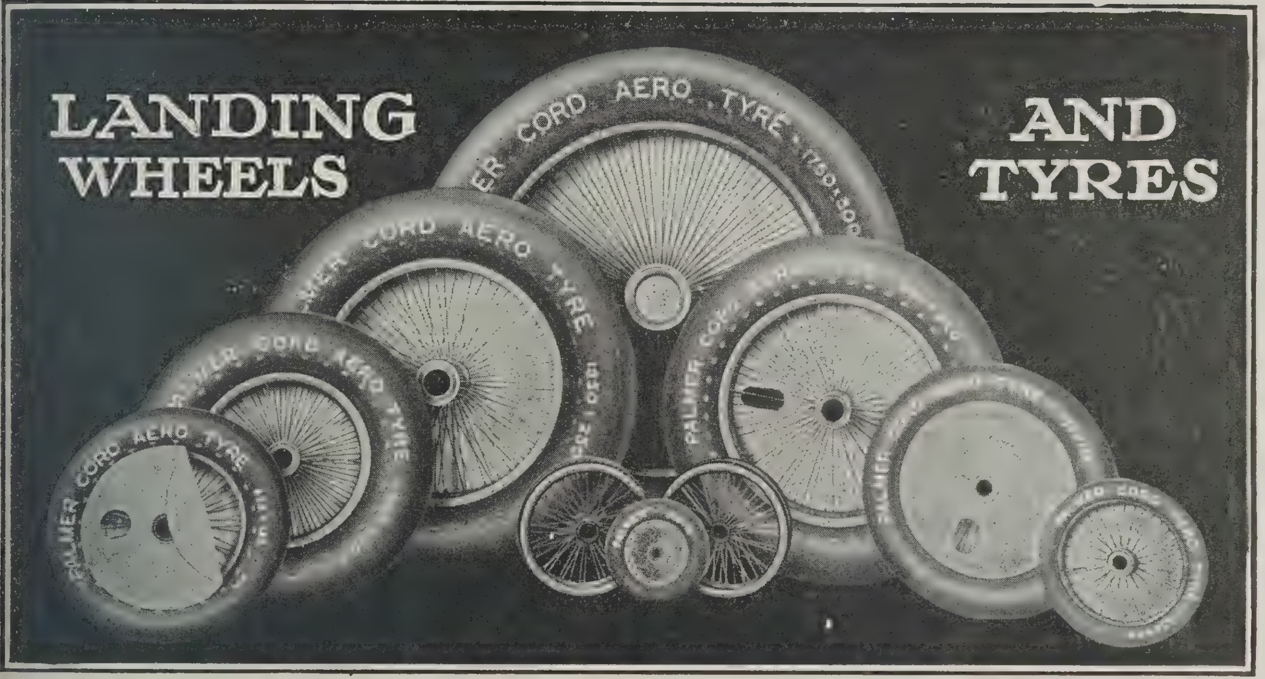
The Fairchild Aviation Corpn., Farmingdale, L.I., N.Y.—The Fairchild Company showed one of its standard "All Purpose" cabin monoplanes fitted with a Wright Whirlwin engine. This machine was described in The Aeroplane fo Dec. 7, 1927. They also showed a specimen of float suitabl for this machine, a Fairchild Caminez engine and a selectio of photographic equipment.

The Ford Motor Co., Fordson, Mich.—The Ford Company in addition to showing the old Bleriot and the Fokker monoplane "Josephine Ford" had on their stand the latest specimen of the three-engined Ford-Stout monoplane (Whirlwin



A NEW AMERICAN AMPHIBIAN.—A Vought Corsair (O-2U) (425 h.p. Pratt and Whitney Wasp engine) fitted with a Loening type amphibian undercarriage. This machine, the first of its type, will make a "shake-down" cruise across the United States from Philadelphia Navy Yard to San Francisco prior to joining the aircraft carrier "Saratoga." It has a top speed of 138 m.p.h.

PALMER



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450 × 60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575 × 60	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	90	150.	38.09	Central
650 × 65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600 × 75	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
700 × 75	78	178.	44.45	132 46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
00 × 100	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
700 × 100	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
650 × 125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
750 × 125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800 × 150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000 × 150	167	185.	55.	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60
1000 × 150	210	185.	60.32	Central
1000 × 180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125 60
900 × 200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100 × 220	134	220.	66.67	Central
,,	136	250.	80.	Central
975 × 225	192	185.	60.32	Central
,,	194	185.	55.	125/60
1250 × 250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500 × 300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750 × 300	159	400.	152.4	Central
,,	191	350.	150.3	Central
1750 × 350	193	400.	125.	Central

Wheels Nos. 161, 162, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres. *†Wheel No. 169 is fitted with Ball Bearings.*
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engines). This machine will be used by Commander Byrd on his Antarctic Expedition this year.

The General Aeronautical Corpn., Cincinnati, Ohio.—This company showed the G.A.C. Nighthawk, a three-seater cantilever biplane fitted with a 90 h.p. Curtiss OX-5 engine.

The General Aircraft Corpn., Hazleton, Penn.—The corporation showed their first product known as the Pilot, of which there is no information available.

The Gillis Aircraft Corpn., Battle Creek, Mich.—Another new company which exhibited its first production. This is a three-seater general purposes cabin biplane fitted with a 125 h.p. Ryan-Siemens engine.

The Halpin Development Co., Cincinnati, Ohio.—The Halpin Company, formed by Mr. T. E. Halpin, formerly with the Ford Company, showed the Halpin Flamingo, an all-metal passenger and express monoplane.

The Hamilton Metalplane Co., Milwaukee, Wis.—The Hamilton Company exhibited two aircraft, the Silver Streak landplane fitted with a 400 h.p. Pratt and Whitney Wasp engine, and the Silver Swan seaplane with a 225 h.p. Wright Whirlwind engine. These machines are constructed entirely of metal, including the covering. In general arrangement they are both cantilever thick-wing monoplanes with the planes built into the top of the fuselage. The pilot's cockpit is in the leading edge of the wing and the passenger cabin is under the wing, the top surface of which forms the roof of the cabin. The landplane has a split type undercarriage and the seaplane is fitted with twin metal floats. The landplane has accommodation for 6-8 passengers.

The Hurd Manufacturing Co., Detroit, Mich.—This company showed its first product of which there is no available information.

The International Aircraft Co.. Cincinnati, Ohio.—This concern exhibited two of its products, the F-17 " Sportsman " and the F-18 " Air Coach " both fitted with the 225 h.p. Wright Whirlwind engine. Both machines have accommodation for five passengers although the former has an open cockpit and the latter an enclosed cabin.

Ireland Aircraft, Inc.—This concern showed the Ireland Neptune amphibian cabin flying-boat fitted with a Wright Whirlwind engine.

The Kreider-Reisner Aircraft Co., Hagerstown, Md.—This company exhibited the Challenger biplane, a normal three-seater open-cockpit biplane fitted with a 90 h.p. Curtiss OX-5 engine.

The E.M. Laird Airplane Co., Chicago, Ill.—The Laird Company showed two of their standard open-cockpit biplanes with the Wright Whirlwind engine, one fitted as a landplane and one as a seaplane.

The Lenert Aircraft Co., Pentwater, Mich.—This new company exhibited a three-seat open-cockpit biplane of normal American outline fitted with a 90 h.p. Curtiss OX-5 engine. It differs from all others, however, as that it is constructed entirely of metal even to the covering which is of corrugated duralumin.

The Lincoln Aircraft Co., Lincoln, Nebraska.—This company exhibited the Lincoln-Page three-seat open-cockpit biplane fitted with the 90 h.p. Curtiss OX-5 engine.

The Loening Aeronautical Engineering Corpn., New York City.—The Loening Company showed one of their well-known Wasp-engined amphibian flying-boats equipped as commercial machine with a cabin for 4-5 passengers. Except for the re-arrangement of the fuselage this machine is identical in appearance and construction to their standard military type. The pilot's cockpit is under the top plane and behind the fuselage swells out to permit of two sets of seats to be installed side-by-side within the cabin.

The Lockheed Aircraft Co., Los Angeles, Cal.—The Lockheed Company exhibited one of its Vega commercial monoplanes with the Wright Whirlwind engine. This machine was described in The Aeroplane on April 18, 1928, and a similar machine was used by Capt. Wilkins on his flight across the North Polar regions.

The B. F. Mahoney Aircraft Corpn., San Diego, Cal.—The Mahoney Company exhibited a Ryan monoplane (Wright Whirlwind engine) of the standard production type. This machine is the commercial version of the " Spirit of St. Louis " used by Charles Lindbergh on his flight from New York to Paris; and was described in The Aeroplane for Dec. 7, 1927.

The Mohawk Aircraft Corpn., Minneapolis, Minn.—This company showed the Mohawk Pinto, which was described in The Aeroplane on Mar. 28, 1928.

National Airways System, Lomax, Ill.—National Airways exhibited two of their standard three-seater open-cockpit biplanes known as the Air King, one fitted with a 90 h.p. Curtiss OX-5 and one with a 120 h.p. Anzani engine.

Niles Aircraft Corporation, Niles, Mich.—This concern exhibited a single-seat sports low-wing monoplane fitted with a 30 h.p. Anzani engine known as the Gold Tip. In appearance it is strikingly similar to the little experimental Ford monoplane which has achieved so much notoriety in the World's press.

The Overcashier Aircraft Manufacturing Co., Detroit, Mich.—This company showed a new type open-cockpit biplane concerning which no information is available.

The Pheasant Aircraft Co., Inc., Memphis, Mo.—This company showed the new three-seater open-cockpit Pheasant biplane fitted with a 90 h.p. Curtiss OX-5 engine.

The Paramount Aircraft Co., Saginaw, Mich.—This new company showed a four-passenger cabin biplane fitted with a 120 h.p. Warner radial air-cooled engine.

Pitcairn Aviation, Inc., Philadelphia, Penn.—The Pitcairn Company showed a Sports model of their standard Mailwing fitted with a Wright Whirlwind engine. This machine differs from the Mailwing, which was described in The Aeroplane on Dec. 7, 1927, in that the mail compartment has been converted into a comfortable cockpit for two and a baggage compartment has been installed behind the pilot's seat.

The Simplex Aircraft Corporation, Defiance, Ohio.—This company showed two Red Arrow monoplanes, both fitted with the 100 h.p. Kinner five-cylinder radial engine. Both machines were side-by-side two-seaters, one with an open and one with an enclosed cockpit. The monoplane wing is mounted on the thrust line of the fuselage and is braced with Vee struts to two Vees under the fuselage which form the rigid portion of the undercarriage. The remainder of the undercarriage consists of two vertical spring members the bottoms of which are linked to the two Vees by radius rods.

The Spartan Aircraft Co., Tulsa, Oklahoma.—The Spartan Company showed their three-seat open-cockpit biplane fitted with a 125 h.p. Ryan-Siemens engine.

The Stearman Aircraft Co., Wichita, Kansas.—The Stearman Company showed one of their standard three-seater open-cockpit biplanes, fitted with a 225 h.p. Wright Whirlwind.

The Stinson Aircraft Corporation, Detroit, Mich.—This corporation showed four aircraft, a standard six-seater Stinson Detroiter cabin monoplane and a four-seater Stinson Detroiter cabin biplane, both with Wright Whirlwind engines, a three-seater Stinson Detroiter-Junior cabin monoplane with a 120 h.p. Warner engine, and the " Pride of Detroit " on which Messrs. Brock and Schlee flew from Newfoundland to Japan last year. The standard Stinson Detroiter monoplane now has a Ryan type divided undercarriage in which the compression members are attached to the wing bracing struts with the split axles hinged to the bottom longerons of the fuselage.

The Stinson School of Aviation, Detroit, Mich.—This school is operated by Mr. J. B. Stinson, a member of the famous Stinson family, but has no connection with the Stinson Aircraft Corpn. It showed the J.B.S. Aircoupé, a high-wing two-seat side-by-side monoplane, fitted with a 90 h.p. Le Blond Air-Cat five-cylinder radial engine. It has an enclosed cabin, and lifting wing-bracing struts, and is equipped with electric starter and wheel brakes.

The Swallow Airplane Co., Wichita, Kansas.—The Swallow Company showed two of their standard three-seat open-cockpit biplanes fitted with the 90 h.p. Curtiss OX-5 engine, one equipped with twin metal Hamilton floats.

Taylor Bros. Aircraft Co., Rochester, N.Y.—This company showed a two-seater side-by-side high-wing monoplane fitted with a 125 h.p. Ryan-Siemens engine.

The Travel Air Manufacturing Co., Wichita, Kansas.—The Travel Air Company showed two of their standard three-seat open-cockpit biplanes, one with the 90 h.p. Curtiss OX-5 engine, rigged as a seaplane, and the other with the 125 h.p. Ryan-Siemens engine as a landplane.

The University of Detroit, Detroit, Mich.—This educational body exhibited an experimental single-seat open biplane seaplane known as the MS-1 fitted with a Bristol Cherub engine It is largely of metal construction and has a welded steel tube fuselage, metal spars and ribs and duralumin floats.

The Chance Vought Corporation, Long Island City, N.Y.—This corporation exhibited the only two military type aircraft in the show. These were both Vought Corsairs, a two-seat high-performance reconnaissance biplane with the Pratt and Whitney Wasp engine. The Corsair landplane was the one specially built for the use of the Assistant Secretary of the Navy and the seaplane was of the standard U.S. Navy type with single central float.

The Wallace Aircraft Co., Chicago, Ill.—The Wallace Company showed a two-seat cabin monoplane fitted with a 80 h.p. Anzani engine.

AERO-ENGINES.

The Curtiss Aeroplane and Motor Co., Buffalo, N.Y.—The Curtiss Company exhibited one of their standard type 600 h.p. V-1550 engines as installed in the Curtiss Hawk fighters and other military aircraft.

The Dayton Airplane Engine Co., Dayton, Ohio.—This company showed the Dayton Cub air-cooled engine for light aircraft. This engine, apparently inspired by the A.D.C. Cirrus, is of the four-cylinder-in-line type and is rated to give 110 h.p. at 1,550 r.p.m. With twin magnetos and car-

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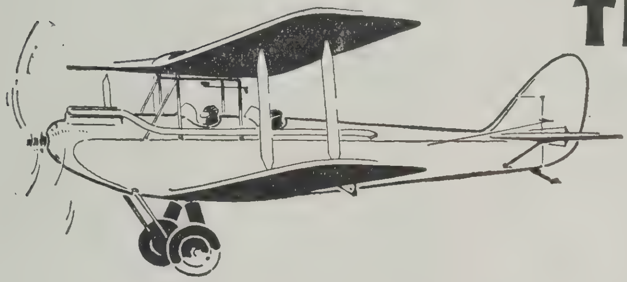

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burettor but minus airscrew hub it weighs 375 lbs. It has a five-bearing crankshaft, aluminium alloy cylinder heads and an overhead camshaft and housing similar in construction to those used in the Liberty engine. Normally it is of the wet sump type but can be easily converted to a dry sump type by the addition of an oil pump, the drive for which is provided. Full forced feed lubrication is provided to all plain bearings while the ball bearings are oil sprayed. The bore and stroke are 4.5 ins. × 7 ins. and the compression ratio is 5.3 to 1.

The Fairchild Aviation Corporation, Farmingdale, L.I., N.Y.—This corporation showed a 135 h.p. Fairchild Caminez cam-engine of the type which has already been fully described in this paper.

The R. K. Blond Machine Tool Co., Cincinnati, Ohio.—This company has taken over the building of the Air-cat five-cylinder radial engine which was originally designed by Mr. Glenn D. Angle for the now defunct Rickenbacher Automobile Corporation. In 1927 the Detroit Aircraft Engine Corpn. was formed to manufacture this engine but it never began production. The Le Blond Company exhibited one specimen of the Air-Cat engine.

The Packard Motor Car Co., Detroit, Mich.—The Packard Company exhibited two 600 h.p. 1500 type engines, one direct-drive and one inverted, two 800 h.p. 2500 type engines, one direct-drive and one geared and the 1,500 h.p. X-2275 24-cylinder "X" engine.

The Pratt and Whitney Aircraft Co., Hartford, Conn.—Pratt and Whitney showed the Wasp and the Hornet radial air-cooled engines of 400 h.p. and 525 h.p. respectively.

The Ryan Aeronautical Corpn., San Diego, Cal.—This new company which has acquired the licence to construct the German 125 h.p. Siemens radial engine in the U.S.A. showed specimens of this engine.

The Warner Aircraft Corpn., Detroit, Mich.—This company showed for the first time its new 110 h.p. Warner air-cooled seven-cylinder radial engine. The cylinder barrels are of steel with aluminium heads and the bore and stroke are 4.25 × 4.25 ins. All accessories and overhead valve push-rods are behind the engine. The push-rods and rear ends of the rocker-arms are enclosed while the front ends of the rocker-arms and valve-springs are exposed. The first engine has passed a 125-hours' manufacturers' test, the standard 50-hour Army Air Corps test and has done several months' flying under various climatic conditions without any serious trouble.

The Wright Aeronautical Corpn., Patterson, N.J.—The Wright Company showed a standard J-5 Whirlwind and a 525 h.p. Wright Cyclone engine which is now being developed for the U.S. Navy.

Of the two aircraft companies who took space but were unable to exhibit aircraft in the exhibition building, the Sikorsky Manufacturing Corpn., of College Point, L.I., N.Y., in addition to a small stand at the show, exhibited their short-hulled amphibian flying-boat fitted with two Wright Whirlwind engines at the Detroit Yacht Club and the Keystone Aircraft Corpn., of Bristol, Penn., showed a number of models and photographs on a small stand.

In addition to the aircraft and aero-engine exhibitors there were over seventy exhibitors of accessories and equipment, a description of which would absorb too much space at the present time.

THE CREW OF THE BREMEN IN NEW YORK.

On April 27 Baron von Hünefeld, Herr Köhl and Major Fitzmaurice arrived at Curtiss Field, L.I., N.Y., from Canada, in a Ford three-engined monoplane in the presence of about 100 spectators.

They immediately left by special train for Washington to attend the funeral of Mr. Floyd Bennett who died at Quebec from double pneumonia caught while acting as pilot of the relief aeroplane which was being flown from New York to Greenly Island.

On April 30 they received the official welcome from New York, which ceremony had been postponed as a mark of respect to Mr. Floyd Bennett.

All the way from the Battery to the City Hall, Broadway was packed with a dense mass of people who regarded the occasion as one on which they could release their feelings, whatever they might be, in some form of hilarity. Showers of ticker tape, torn-up telephone directories, newspapers, etc., were released from high windows and cheers were accorded anything that caught the crowd's fancy from a motor-cycle policeman to a squad of troops.

The three heroes of the day, seated on the lowered top of a motor-car, were whisked through the crowd so fast that it was barely possible to distinguish one from the other.

At the City Hall in the presence of 10,000 people they received from the Mayor the City's Scroll of Honour and listened to various eulogistic speeches to which they made modest replies.

After the ceremony they proceeded to Central Park where they received New York State's Medal of Valour.

Finally they were conducted through the thronged streets back to their hotel. From the time they landed at the Battery from the municipal steamer until the ceremonies in Central Park ended the police had the greatest difficulty in handling the enthusiastic crowds.

ENGLAND—AUSTRALIA.

Wing Cdr. E. R. Manning, D.S.O., M.C., R.A.F., who left Lympne on April 23, flying a Westland Widgeon (A.D.C. Cirrus engine) in an attempt to fly to Australia, reached Marseilles on April 24 after landing at Le Bourget and Lyons for petrol. On April 26 he left Marignane aerodrome at dawn and flew by compass course to St. Raphael and across the Mediterranean, passing over Ajaccio and across Sardinia. He landed at Tunis at 12.30 hours and re-fuelled, but broke his tail-skid taxi-ing out. On April 27 he made another attempt to leave for Homs, but the engine seized as he was taking off and he has had to telegraph for new cylinders and pistons.

New cylinders and pistons were dispatched from England on April 28.

MR. STACK'S TOUR.

Mr. Neville Stack with Mr. E. C. Bowyer of *The Daily News* on the Avro Avian on which they are making a tour of France, Spain, North Africa and Italy, left Biarritz on Wednesday, April 25, and flew to Quatro Vientos aerodrome near Madrid after 4 hours 20 mins. of fairly rough flight. Here the machine was filled with fuel and oil and then flown to the Getafe civil aerodrome which has better accommodation for civil aircraft.

While the Avian was being taxied to its shed at the latter aerodrome a mule drawing a cart bolted, collided with the machine, bent the Fairey airscrew and damaged the fuselage.

Repairs were completed by Sunday, April 29, but bad weather, including very heavy rain, prevented any departure from Madrid on that day.

THE BRISTOL AIR PAGEANT.

The first of the four official Light Aeroplane Club Air Pageants takes place at Filton, Bristol, on May 5, under the auspices of the Bristol and Wessex Aeroplane Club.

Flying will begin early in the morning as owing to the exceptionally large entry list for all competitive events, a number of heats will have to be run off before the opening of the Pageant proper at 14.00 hours. During the morning the public will have the opportunity of joy-riding in aircraft provided by Imperial Airways and the Surrey Flying Services.

The programme will open at 14.00 hours with a parade of machines past the public enclosures. Thereafter until 18.00 hours the afternoon will be devoted to a programme of events of all types including an inter-club race for the Selfridge Cup, an open handicap for the Talbot O'Farrell Trophy, a balloon-bursting competition, etc. Mr. Hubert Broad will give a demonstration on the slotted-wing Moth, and Miss June will "wing-walk" and make a parachute-jump.

The R.A.F. are providing a miniature display which will include formation flying, aerobatics, air fighting and bombing of ground targets, etc.

At 18.00 hours Her Grace the Duchess of Beaufort will present the prizes and from then until dusk joyrides will again be available.

Enclosures.—The members' enclosure (15s. to non-members) and the 5s. enclosures are on the North side of the aerodrome, and admission to both is obtained from Hayes Lane, so that those motoring from Bristol will be well advised to take the route through Westbury-on-Trym, Henbury and Charlton.

The 1s. enclosure is on the South side of the aerodrome, admission to which is gained from the main Gloucester Road at the bottom of Filton Hill, so for this enclosure motorists will do best to come from Bristol via Horfield or Southmead.

The 6d. enclosures are on the side of Filton Hill, whence an excellent general view is obtained.

The entrances to the 6d. enclosures are along Golf Club Lane off the Southmead Road and from about half-way down Filton Hill on the main road.

THE HAMPSHIRE AIR PAGEANT.

All those who are desirous of entering for any of the events at the Hampshire Air Pageant, which takes place on Whit-Sunday and Monday, May 27-28, are requested to write to Flt. Lt. C. Crawford, the Hampshire Aeroplane Club, Hamble, near Southampton, who is in charge of the Entries Section of the Pageant Committee. Mr. Crawford will be glad to hear from anyone who is considering visiting Hamble by air, whether as a competitor or not, so that some idea may be gained as to the possible number of machines likely to be present.

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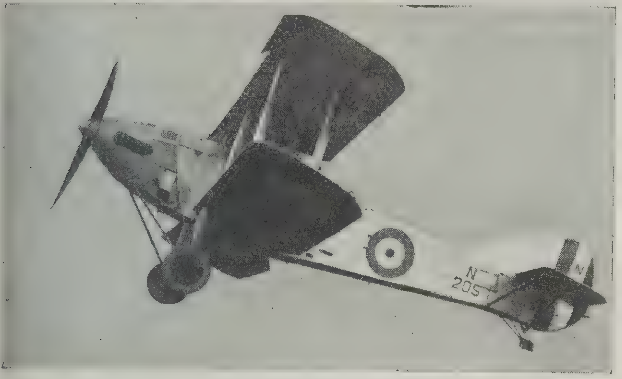

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THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending April 29.

Flying Time 52 hr. 15 min. *Instruction* 41 hr. 45 min. *Soloists* 10 hr. 30 min. *Instruction.—With Mr. S. L. F. St. Barbe*—Mrs. Fraser, Lord Carlow, Miss Wilson, Messrs. A. L. A. Petty, B. Merry, G. Lyon, E. K. Blyth, E. A. Lingard, R. Richmond-Brown, R. Ward, J. C. V. K. Watson, E. R. Andrews, A. J. Mulder, F. C. Fisher, L. G. Sykes, G. Black, D. Green. *With Mr. F. R. Matthews.*—Miss Fletcher, Miss Wilson, Messrs. A. P. Glenny, J. D. M. Robinson, S. Hansel, A. O. Wigsell, A. S. Richardson, T. A. Browne, J. A. Murphy, H. R. Presland, B. L. Middleton, L. W. Gibbens, H. Sutton, R. Richmond-Brown, A. J. A. Miller, S. M. Nesbitt, G. C. Gotheridge, R. Anderson, A. Mason. *Soloists.*—Major R. M. S. Veal, Messrs. G. H. Craig, E. E. Stammers, J. A. Brewster, R. Ward, R. Sanders-Clark, B. B. Tucker, M. L. Bramson, E. E. Fresson, Will Hay, F. C. Fisher, L. W. Gibbens, P. W. Hoare, G. Black, E. C. T. Edwards, D. H. P. Esler.

Moth G-EBMT met with an accident on Saturday last, while being flown by Mr. G. Black. A new undercarriage and possibly two new wings will be required.

The Members will have received the circular setting out the proposals put forward by the Committee, and calling a Meeting of the Members for May 7, at 18.00 hours, at the Royal Aeronautical Society, 7, Albemarle Street, London, W.1. It is hoped that all Members will make a special effort to attend this Meeting.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending April 28

Flying Time 44 hr. 50 min. *Instruction* 18 hr. 25 min. *Soloists* 17 hr. 5 min. *Passenger Flights* 8 hr. 15 min. *Tests* 1 hr. 5 min. *Instruction.—With Mr. Baker*—Miss Baerlein, Miss Emery, Miss Hill, Messrs. Chart, Sellers, Weale, Stern, Benson, Eills, Greenhalgh, Harrison, Riley, Taylor, Goss, Birley, Garner, Secker, Taylor, J. Mason, Pattrieoux, Johnson, Tweedale, Gort, Barlow, Watson, Mills. *With Mr. Cantrill*—Miss Emery, Messrs. Cohen, Barlow, Slack, Mason, Weale. *With Mr. Scholes*—Messrs. Fallon, Goss. *Soloists (under instruction).*—Messrs. Gort, Brooking, Mills, Gerrard, Tweedale. *Pilots.*—Messrs. Cohen, Hall, Williams, Harber, Davison, Crosthwaite, Gattrell, Lacayo, Twemlow, Hardy, Cantrill, Birley, Caldecott, Michelson, Nelson, Goodfellow, Meads. *Passengers* 19.

Except for high winds the weather has been good. As it was, fifty-seven members put in a total of 44 hr. 50 min., our best this year.

Two good height tests were made on QL; Mr. Brooking climbed to nearly 7,000 ft. and descended again in the space of 18 min. Mr. Mills, during his descent with engine shut off, lost his "prop" and came in with a dead engine, making an excellently-judged side-slip approach and landing.

Messrs. Cantrill and Goodfellow flew over to Blackpool on Monday and again on Wednesday for the R.A.F. visit of inspection, when R.A.F. support for the Blackpool flying meeting was promised.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending April 29.

Flying Time 34 hr. *Instruction* 10 hr. 45 min. *Soloists* 3 hr. 5 min. *"A" Pilots* 18 hr. *Passengers* 55 min. *Tests* 1 hr. 15 min. *Instruction.—With Mr. Parkinson*—Mrs. Kish, Miss Rambaut, Miss Klyver, Messrs. L. M. Middleton, Redshaw, White, Hayton, L. B. Dickindon, Cochrane Carr. *Soloists.*—Messrs. Brooks, Percy, Mechan, Dr. Alderson. *"A" Pilots.*—Mrs. Heslop, Miss Leathart, Dr. Dixon, Messrs. Heppell, Phillips, H. Ellis, Runciman, C. Thompson, D. Wilson, J. J. D. Irving, Stobie, N. S. Todd, Lloyd Browne, F. L. Turnbull, A. Bell. *Passengers.*—7.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending April 28.

Flying Time 41 hr. 5 min. *Instruction* 13 hr. 25 min. *Soloists* 26 hr. 25 min. *Passengers* 1 hr. 15 min. *Instruction.—With Mr. Beck*—Messrs. Upton, Senior, Bell, Gill, Goulden, Humpheries, A. Crowther, Ostler, Collins, Clayton, Lupton, Fitton, Woolley, Bamford, Dane. *With Mr. Stockbridge*—Mr. Ostler. *Soloists.*—Messrs. Dick, Humpheries, A. Crowther, H. Crowther, Birch, Ambler. *"A" Pilots.*—Messrs. Thomson, Mann, Clayton, Wood, Norway, Ellison, Lister. *"B" Pilots.*—Mr. Fielden. *Passengers.*—17.

This week has been the brightest yet in every sense of the word. Every day has been more or less flyable, and evening flying has proved itself extremely popular with our members.

RF and SV functioned perfectly and our hours are compiled on these two machines with the exception of Saturday evening, when we had the use of TA, kindly lent by the Blackburn Aeroplane Co.

We would like to draw attention that from now on flying will begin at 14.00 hours on Tuesdays, Thursdays and Saturdays to enable the ground staff to compete with the maintenance work as the machines are in use till dusk.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending April 28.

Flying Time 29 hr. 17 min. *Instruction* 11 hr. 30 min. *Soloists* 14 hr. 4 min. *Passengers* 2 hr. 56 min. *Test* 47 min. *Instruction.— With Flt. Lt. T. Rose.*—17. *Soloists.*—16. *Passengers.*—11.

On Sunday the Club put in 12 hours' flying which broke the previous record of 10 hours 30 minutes.

During the week Messrs. J. R. H. Baker, G. H. Aldridge, E. D. Wynn, A. B. Gibbons, G. Robson, and A. Ellison successfully passed the flying tests for their "A" Licence.

Messrs. Baker and Aldridge have joined No. 605 County of Warwick Bombing Squadron, Auxiliary Air Force.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending April 29

Flying Time 57 hr. 20 min. *Instruction* 21 hr. 30 min. *"A" Pilots* 17 hr. 45 min. *Soloists* 4 hr. 35 min. *Passenger Flights* 12 hr. 20 min. *Tests* 1 hr. 10 min. *Instruction.—With Flt. Lt. Swoffer.*—32. *"A" Pilots.*—12. *Soloists.*—13. *Passengers.*—39.

We have broken several records for the Club this month, i.e., 153 hours, with a record week of 57 hours, one record day of 16½ hours, with a record solo after 3 hours' 15 minutes' dual instruction. Our Avian has had a gruelling time and has stood up splendidly to the test, and except when refilled, has been in the air constantly for three months with never a breakdown. Our two Moths have had their share of the work, but all dual is done on the Avian and it stands the shocks of hundreds of landings each week.

Mr. Tillard did a successful solo after 3 hours' 15 minutes' dual. Mr. Watson-Taylor also successfully completed a circuit and landed for the first time alone.

Flying Time for the month of April 153 hr. 15 min. *Instruction* 61 hr. 25 min. *"A" Pilots* 43 hr. 55 min. *Soloists* 19 hr. 45 min. *Passenger Flights* 23 hr. 20 min. *Tests* 4 hr. 50 min.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending April 29.

Flying Time 10 hr. 50 min. *Soloists.*—Messrs. W. A. Ramsay, F. Gough, R. Potter, N. Brett, H. Mack, W. P. Cubitt, R. T. Harmer, H. A. Pank, G. Surtees. *Passengers.*—21.

We understand on good authority one of our members is building an aircraft of his own and look forward to its maiden flight.

We have several new flying pupils starting instruction; it must be the fine weather bringing them out.

We shall be very glad when our Moth is in commission again.

The aerodrome is now the scene of warfare. One morning we found it dotted over with the tin huts and tents of an army, and we find it advisable to leave these severely alone.

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending April 21.

Flying Time 5 hr. 25 min. *Instruction* 1 hr. 55 min. *"A" and "B" Pilots* 1 hr. 45 min. *Soloists* 55 min. *Passenger Flights* 35 min. *Tests* 15 min. *Instruction.—With Mr. G. E. Lowdell.*—8. *"A" and "B" Pilots.*—2. *Soloists.*—3. *Passengers.*—4.

Report for week ending April 28.

Flying Time 17 hr. *Instruction* 6 hr. 55 min. *"A" and "B" Pilots* 3 hr. 30 min. *Soloists* 2 hr. 30 min. *Passenger Flights* 3 hr. 30 min. *Tests* 35 min. *Instruction.—With Mr. G. E. Lowdell.*—9. *"A" and "B" Pilots.*—3. *Soloists.*—5. *Passengers.*—31.

Mr. C. Hanson and Mr. F. Verney both made successful first solos during the week. The membership has increased by about 25 per cent. since the Display and inquiries are pouring in. This is most satisfactory and, as the Club has now two machines, members are assured of ample opportunity to fly every day of the week except Friday.

Unfortunately we have one misfortune to record. Mr. Courtney N. Prentice, to whose energy and enterprise the Club owes its formation, has been forced to resign the Hon. Secretaryship owing to the demands upon his time of his own business affairs. Fortunately he will not be lost to the Club as he still remains upon the Board o Directors. Major P. L. Holmes, D.S.C., has been appointed Secretary In future all correspondence should be addressed to The Aerodrome Hadleigh, Suffolk. Telephone, Hadleigh 57. Office hours will in future be from 2.30 to 5.30 p.m. daily except Friday.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending April 29.

Flying Time 11 hr. 30 min. *Dual* 4 hr. *Soloists* 7 hr. 30 min

A new Avian arrives at the Club this week, the property of ou member, Mr. L. E. R. Bellairs, on which he and Mr. F. G. Mile are making a tour of the South of France, starting next week.

FLYING SCHOOLS.

Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending April 25.

Flying Time 45 hr. 50 min. *Instruction.—With Mr. H. D. Davis—* Messrs. Quilter, Hamilton, Mitchell, Whiteley, Hughes, Hsiao, Habsburg, Dr. Wall, Col. Rice and Mr. Worley. *With Mr. A. E. Golds—* Messrs. Payne, Mitchell, Col. Rice, Jonassen, Bellville, and Mis Kidstone. *Soloists.*—Messrs. Whiteley, Habsburg, Hamilton, Mitchell Anderson, Jonassen, Dr. Wall.

Messrs. Jonassen, Whiteley and Habsburg have now completed al their tests for the R.Ae.C. Licence.

We have now turned out eleven qualified pilots since Jan. 1, 1928 and several soloists are almost ready to do their R.Ae.C. tests.

Sir Sefton Brancker paid the School a surprise visit on Sunday an showed much interest in our activities.

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 8; Monday, 22; Tuesday, 23; Wednesday, 24; Thursday, 22; Friday, 26; Saturday, 23.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 59, passengers 490, freight 15 tons.

Air Union:
Paris—London: Machines 40, passengers 181, freight 15 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 15, passengers 100, freight 14¼ tons.

Sabena:
Brussels—London: Machines 12, passengers 35, freight 1½ tons.

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 21, passengers 47.

Private:
Machines 1, passengers 1.

Total number of trips by British Machines, 60, carrying 491 passengers. Foreign Machines, 88, carrying 363 passengers.

COMPARATIVE FIGURES.

Week ending April 28:
Machines, 148; Passengers, 854; Crews, 282; Total personnel, 1,136
Corresponding week, 1927:
Machines, 101; Passengers, 528; Crews, 170; Total personnel, 698.
Corresponding week, 1926:
Machines, 89; Passengers, 400; Crews, 112; Total personnel, 512.
Corresponding week, 1925:
Machines, 82; Passengers, 441; Crews, 120; Total personnel, 531.
Corresponding week, 1924:
Machines, 44; Passengers, 99; Crews, 75; Total personnel, 174.
Corresponding week, 1923:
Machines, 117; Passengers, 475; Crews, 191; Total personnel, 666.
Corresponding week, 1922:
Machines, 109; Passengers, 234; Crews, 156, Total personnel, 390.
Corresponding week, 1921:
Machines, 65; Passengers, 227; Crews, 79; Total personnel, 306
Corresponding week, 1920:
Machines, 84; Passengers, 126; Crews, 96; Total personnel, 222.

Croydon Notes.

The new control-tower was put into regular service on Thursday, April 26, and has been working satisfactorily since —to the great relief of all concerned. Satisfactory reception of both telegraphic and telephonic communications on the ame aerial can now be received, and the various minor, but rritating, difficulties which have delayed the regular use of his station have now been overcome.

From the point of view of the traffic-control staff, the new control-tower is a vast improvement on the old one. It is roomy, conveniently arranged, and comfortable, and in the opinion of those who have seen all the most recent Continental aerodromes it is more completely and more usefully equipped than any other similar installation—at any rate on this side of the Atlantic.

The new Aerodrome Hotel building was ready for occupation, and furniture was being installed in it during the end of last week. It will be open for service during the present week.

Thus when the new buildings are opened by Lady Maud Hoare on Wednesday, May 2, the only building still officially occupied on the Plough Lane site will be the C.A.T.O's bungalow.

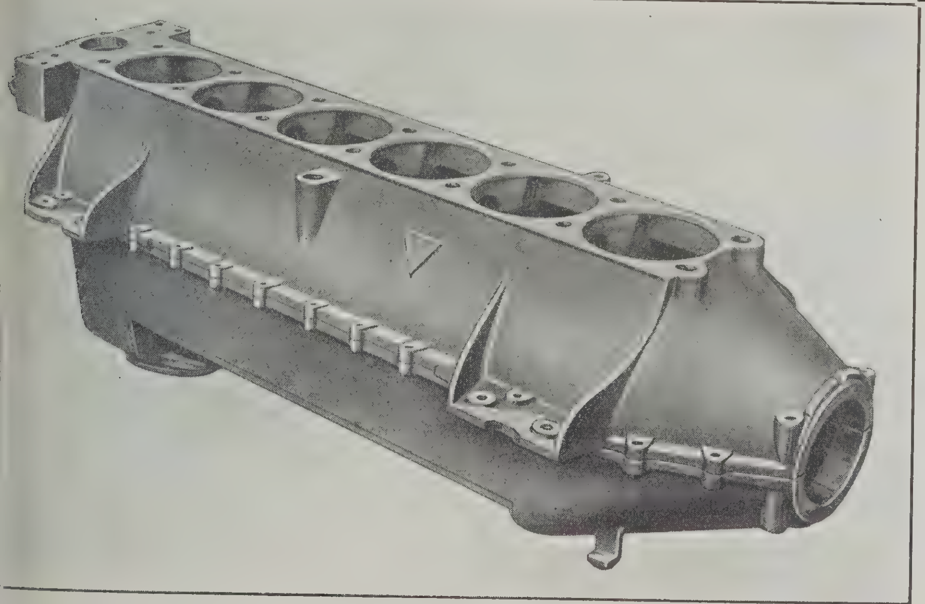
Actually, the old control-tower and wireless equipment, remain as a stand-by, the Neon beacon is still on its old site, and Imperial Airways engine shop has not yet moved. From the new buildings it looks as though very little progress had been made in clearing the old site, but a closer view shows that most of the smaller buildings have been demolished. Nevertheless, it will be a long time before this devastated area can form a usable part of the aerodrome surface.

Starting from Tuesday, April 24, the Deutsche Luft-Hansa are running a daily service each way for goods only between Croydon and Amsterdam in addition to the normal passenger service. This service does not take advantage of the extra hours of daylight now available, so presumably it is an index of a growing demand for transport between England and Germany.

On Friday, April 27, Imperial Airways had to triplicate their midday "Silver Wings" service. Two Argosies and one W.8 were sent off between 12.00 and 13.06 hours. This was in addition to the normal early morning service, and to the machine for Zurich via Paris. Though Friday was notably the heaviest day of the week on this service, on an average one machine more than normally scheduled was run each way over the London-Paris route per day during the whole week.

THE RAND-DURBAN AIR SERVICE.

According to *The Times*, negotiations for the inauguration of the Rand-Durban air service are completed. African Airways Limited will be registered shortly with a capital of £50,000 sterling. The directors, all prominent Rand business men, include Sir George Albu and Sir Llewellyn Andersson Major Miller will be technical adviser.



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Under the agreement the Government undertakes to pay the company a subsidy of £8,000 per annum for the first two years. After this the company's accounts will be reviewed annually, and, if it has made a net profit in excess of 10 per cent. on the paid-up capital, the subsidy in the following year will be reduced in proportion. The Government also undertakes to collect a special fee at a prescribed rate, over and above ordinary postage, on all postal articles despatched by air mail, and to pay over to the company the total value of such fees, less 10 per cent.; to convey mails to and from the aerodrome free to the company; to provide an efficient meteorological service; not to negotiate during the period of the contract, or of any extension or renewal thereof, with any other company for the development of any other air routes in the Union, without notifying the company of such negotiations, nor sanction any air service operating along the route covered by the present agreement; to allow the importation free of all aeroplanes, aeroplane engines, spares and accessories; and to convey over the railways in the Union, at the lowest tariff rates, the above-mentioned goods, in addition to petrol, oil, and stores belonging to the company, and intended for the purposes of the agreement.

AN EAST INDIES AIR SERVICE.

The Singapore correspondent of *The Times* reports that negotiations are proceeding between the Government of the Straits Settlements and the promoters of a scheme for the provision of a seaplane service between Singapore-Batavia, Singapore-Belawan (Sumatra), Belawan-Penang, and Singapore-Penang.

It is proposed that a local company shall be formed which will work in co-operation with a Dutch company which is starting services from Batavia to Singapore and from Batavia to Belawan on Jan. 1, 1929. The Singapore-Batavia service will probably run twice or thrice weekly and the Singapore-Penang service twice a week. The Dutch are starting a Batavia-Sourabaya service in September next. A weekly mail service will probably be run in the winter season from Singapore to Calcutta via Penang, Victoria Point, Rangoon, and Akyab. The whole scheme is subject to the approval of the Government of the Straits Settlements. A subsidy and a mail contract will be necessary. The Government is most sympathetic. The scheme is backed by powerful interests in England. The directors of the Air Survey Company, of London, will be in charge of the technical side of the scheme.

LUFT-HANSA AND THE FUTURE.

To mark the opening of the summer schedules of the Deutsche Luft-Hansa's air services on Monday, April 23, the directors of the company arranged a demonstration for the benefit of foreign Diplomatic representatives, German municipal authorities and the Press. This year this demonstration instead of being held at Tempelhofer aerodrome was transferred to Wansee where seaplanes of various types could be demonstrated on the lake.

Herr Merkel and Herr Milch, directors of the Luft-Hansa, in the course of speeches at this demonstration, foreshadowed the policy of their firm in regard to schemes for an air service across the South Atlantic using large flying-boats.

The first of the new Rohrbach Romar flying-boats is expected to be finished during the next month or two. This machine is to weigh fully loaded about 19,000 kg. (42,000 lbs.) and will be fitted with three B.M.W. engines of 800 h.p. each. It is to have accommodation for 12 passengers, and a range of 4,000 km. Three of these machines have been ordered by the Deutsche Luft-Hansa, with the intention of testing their suitability for such a service as that foreshadowed. In addition the gigantic Dornier monoplane if it proves successful will be used for this service.

It is hoped that first trial flights over the South Atlantic may be made during this year but there is no likelihood of any regular service even for mails starting before 1929.

The route proposed is overland to Spain and North Africa, thence to the Canary and Cape Verde Islands, and from the latter to Fernando Noronha off the coast of Brazil. In Brazil the Condor Syndicate which is in close financial relations with Luft-Hansa have already arranged for the institution of services along the Eastern Coast of South America.

The only really long jump across sea on this route is the 1,500-mile trip from the Cape Verde Islands to Fernando Noronha, and apparently no serious doubt is felt in Germany that machines suitable for commercial operations on this service can be developed in the near future.

Four days only would be required to reach Buenos Aires from Germany by this service as against a minimum of eighteen days by steamer, and the directors of Luft-Hansa believe that such a service, unlike the Continental services now operating, would rapidly become self-supporting.

THE SOVIET-AFGHAN AIR AGREEMENT.

Further details of the Soviet-Afghan Air Agreement for an air service between Kabul and Tashkent, which was noted in THE AEROPLANE for April 25, have been published in *The Times.*

The Agreement is valid until Jan. 1, 1929. It provides that, should an accident befall a machine belonging to either Government while flying in the other's territory, the Government in whose territory the machine lands shall be responsible for transporting it to the frontier, where it will be taken over by its own Government for repairs, unless it is decided to make use of the workshops in the territory in which the machine lands.

Each Air Department will be responsible for the protection of the other's machines while outside their own territory. In the case of an aeroplane damaged by neglect a mixed commission of inquiry will be held, the party responsible paying the damages. The control of Customs in regard to non-diplomatic persons will be effected according to the rules and regulations of the contracting parties. Passports will be examined before an aeroplane starts.

The journey from Kabul to Tashkent and *vice versa* is scheduled to take one day. There will be a service from both centres twice each month, but special flights will be undertaken if two days' notice is given.

THE QUALITY OF MERSEY.

The magazine of the Mersey Dock Board Staffs' Guild, yclept *Mersey*, for April, 1928, publishes a vey interesting article on the Schneider Trophy Contest and Liverpool's claim to have it held on Merseyside. The course suggested in this article is from Liverpool to Southport or even to Blackpool and back to Liverpool.

From the point of view of accommodation, there is no doubt that Liverpool has claims over anywhere else on the North-West coast. The actual finishing point suggested is at Seaforth and there is an immense stretch of open coast all the way from there to Southport from which millions of people could see the contest.

On the other hand, from Southport to Liverpool, the coast forms an arc of a circle, and a great strain would be imposed on the pilots of very high-speed machines in following this curve all the way instead of being able, as they would on a straight-sided triangular course, to make for a point straight ahead after each turn. One fears that this alone will be enough to put the Liverpool—Southport or Liverpool—Blackpool course completely out of the running.

UNDER REVIEW.

The following books are reviewed in "THE AEROPLANE" this week and may be had from

THE AEROPLANE BOOK DEPT.,

14, Bream's Buildings, E.C.4.

THE ART OF FLYING.
Capt. Norman Macmillan. 5/4 post free

THE GERMAN-ENGLISH, ENGLISH-GERMAN MILITARY DICTIONARY.
Kurt Hilmar Eitzen. 8/6 post free

AN APPROACH TO WINGED FLIGHT. J. D. Batten. 5/4 post free

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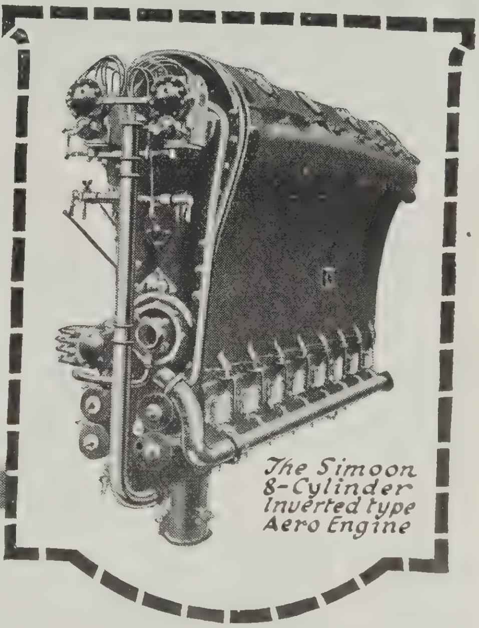

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A GIANT FLYING-BOAT ACCIDENT.

On April 25, the Penhoët five-engined flying-boat (Gnôme-Rhône Jupiter engines) fell into the estuary of the Loire and sank. The pilot and two mechanics were rescued, slightly injured, but the designer, M. Richard, who was on board, was drowned.

This machine, which was completed by the *Chantiers et Ateliers de St. Nazaire* (Penhoët) early in 1926, was a large cantilever monoplane flying-boat with one engine in the nose of the main body and four distributed along the leading edge of the wing. It made its first flight on June 26, 1926, but it was found that with engines off it was distinctly sluggish in answering the controls at low speeds. On the occasion of its first trials, it was damaged owning to the pilot's inability to flatten out when alighting with the engines switched off. It would appear that a similar trouble was the cause of the present unfortunate accident.

NEW COMPANIES.

Cobham-Blackburn Air Lines.—Registered as a private company on April 24, with a nominal capital of £1,000 in £1 shares. The objects are to acquire as going concerns those portions of the businesses and negotiations carried on (1) by the North Sea Aerial and General Transport Ltd., and (2) by Alan Cobham Aviation Ltd. relating to proposed African Air Services, to adopt an agreement with the said companies; to promote a company whose principal object will be to establish, maintain and watch lines of aerial conveyances in Africa and elsewhere; to establish, maintain and work lines of aerial conveyances between Alexandria and Capetown, and between other places selected by the company; to manufacture and deal in aerial conveyances of all kinds, and the component parts thereof; to acquire, provide and maintain hangars, garages, sheds, aerodromes and accommodation in relation to such conveyances, etc. The subscribers (each with one share) are:—C. E. Ward, 237, King's Road, Chelsea, S.W.3, company secretary. E. Hudson, F.C.I.S., Woodborough, Lidgett Park Avenue, Roundhay, Leeds. The first Directors (to number not less than two nor more than seven) are Sir Alan Cobham, R. Blackburn, Col. W. Wright and Capt. T. A. Gladstone. No share qualification required. Solicitors: Kenneth Brown, Baker, Baker, Lennox House, Norfolk Street, W.C.2.

Taxiplanes Ltd.—Private company. Registered April 23. Capital, £1,500 in £1 shares. Objects: To promote, assist and encourage aerial navigation in all its forms, to maintain and use aircraft for the transport of passengers and goods, etc. The first directors are: C. S. Clarke, 13, Queen's Road Clevedon, Som. G. V. Yorke, 497, Felixstowe Road, Ipswich. Jessie M. Clarke, Haviland, Clevedon. Manager: C. Sidney Clarke. Registered office: 13, Queen's Road, Clevedon, Somerset.

WESTERN AREA
PAGEANT
FILTON, BRISTOL.
NEXT SATURDAY.

PERSONAL NOTICES.

Deaths.

MEAKIN.—On April 27, at Cranwell, as the result of a flying accident, Flt. Cadet Peter A. Meakin, beloved son of Mrs. Thurston, of St. Michael's, Weybridge, aged 20.

TURNER.—On April 25, at Attock, India, as the result of a flying accident, L-AC. Arthur Turner, R.A.F.

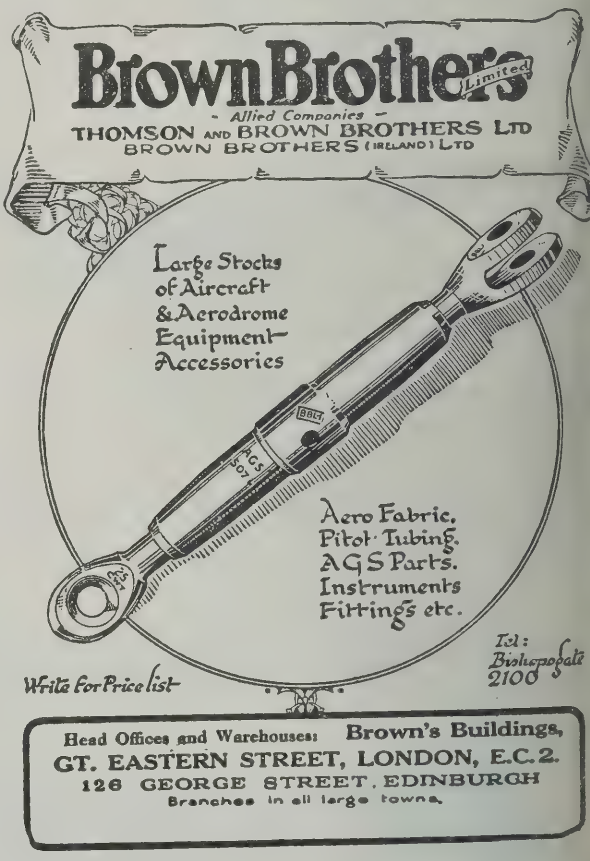
Marriages.

ARMOUR—MILLS.—The marriage of Flg. Off. J. G. D. Armour, R.A.F., younger son of Col. G. D. Armour, of Malmesbury, Wiltshire, and of the late Mrs. Emma Denholm Armour, and Margaret, only daughter of Mrs. Patterson, of Ashton Keynes, Wiltshire, and of the late Mr. T. S. E. Mills, took place, very quietly, in Bristol on April 21.

CAUNTER—MURRAY.—The marriage took place on April 24, at the Church of Our Lady and St. Winifrides, Kew Gardens, between Flg. Off. Cyril Francis Caunter, R.A.F., son of Mr. L. G. Caunter, of 8, South Mansions, Brondesbury, N.W.6, and Kathleen Eve Murray, daughter of Mr. and Mrs. Patrick Murray, of 32, Pensford Avenue, Kew Gardens.

Birth.

BRETT.—On April 29, at Sunnybanks, Eastchurch, Kent, to Rosamond (*née* Davidson), wife of Flg. Off. W. J. Brett, R.A.F.—a son.



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THE AIR PORT OF LONDON

THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

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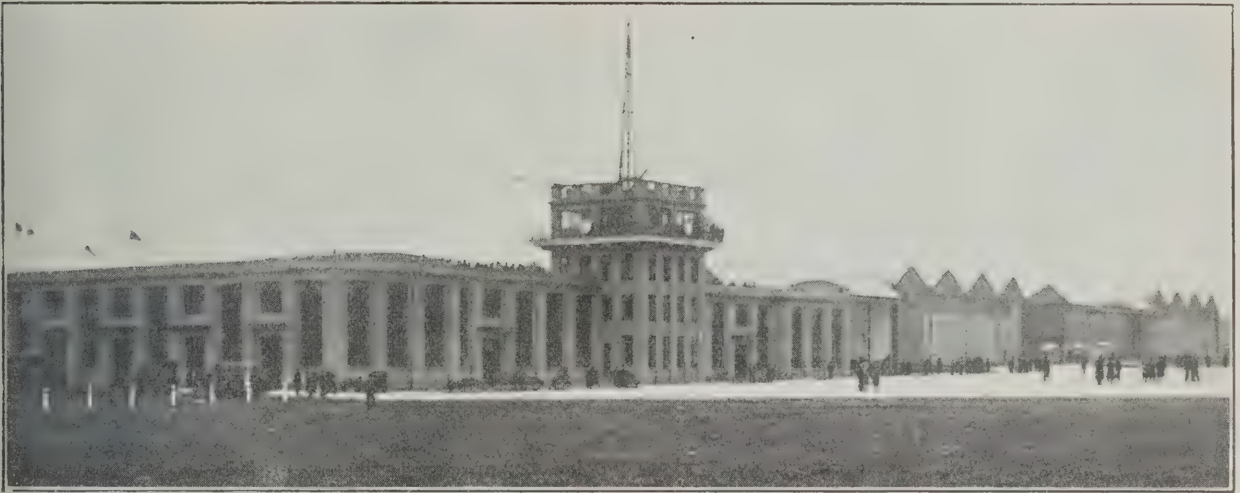
"THE SUBURBS SHALL SHAKE AT THE SOUND OF THE CRY OF THY PILOTS."—(EZEKIEL xxvii. 28.)



THE AIR PORT OF LONDON:—The new Administrative Building at Croydon Aerodrome, which was officially opened by Lady Maud Hoare, D.B.E., on Wednesday, May 2, 1928.

Lady Heath wires:

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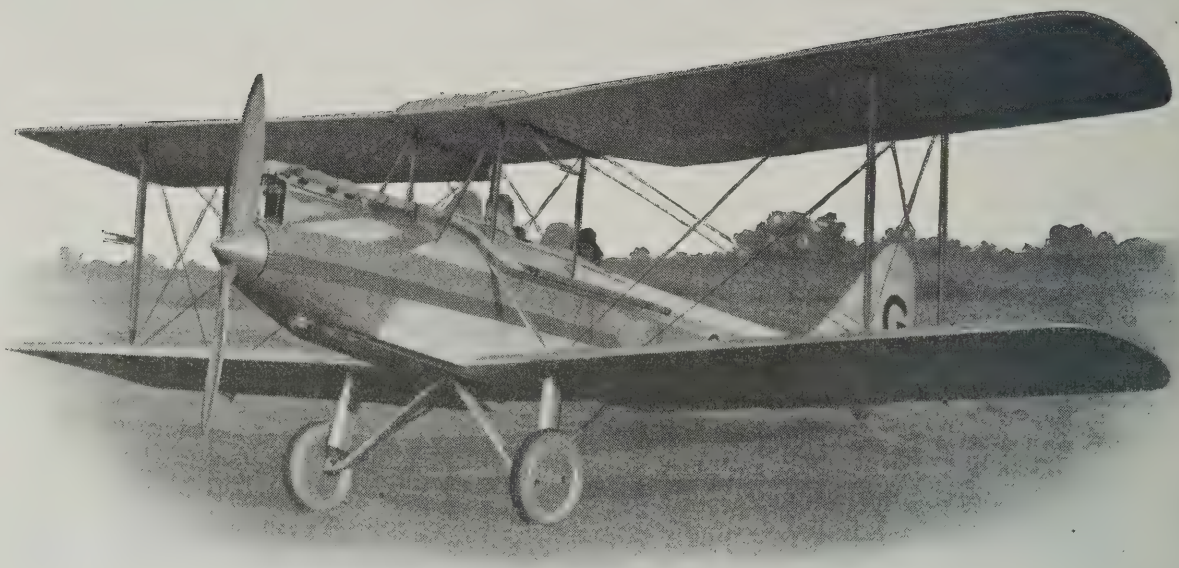

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MAY 9,
1928.

THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV
No. 19.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
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ON AMERICA AND THE WORLD=MARKETS AGAIN.

One of the most pleasing things about the 100% American is that he retains so many essentially English characteristics, among them being a love of fair play, especially when fair play is essential and not merely a sporting pose. After all this is not remarkable, for America is populated entirely by adventurers, and your true adventurer must necessarily be a sportsman who is prepared to take hard knocks and give them without malice. Even the most newly-arrived immigrants to America had at least enough of the spirit of adventure to tear themselves up by the roots from their home countries and take their chance in a strange land. And the ancestors of those Americans who have lived on the other side of the Atlantic for centuries undertook even a greater adventure in chancing their luck among the indigenous savages of North America.

That fact being recognised, we stay-at-home Europeans can more easily understand how it is that the average American will take risks which the average European will not, in the way of crazy railway-bridges, grade-crossings without gates, reckless car-driving, dare-devil flying in experimental or uncertified aircraft, and so forth. And for the same reason, American business men will undertake financial ventures, such as backing new inventions and finding money for new enterprises, and speculating in new markets n a way which does not appeal to the English business man.

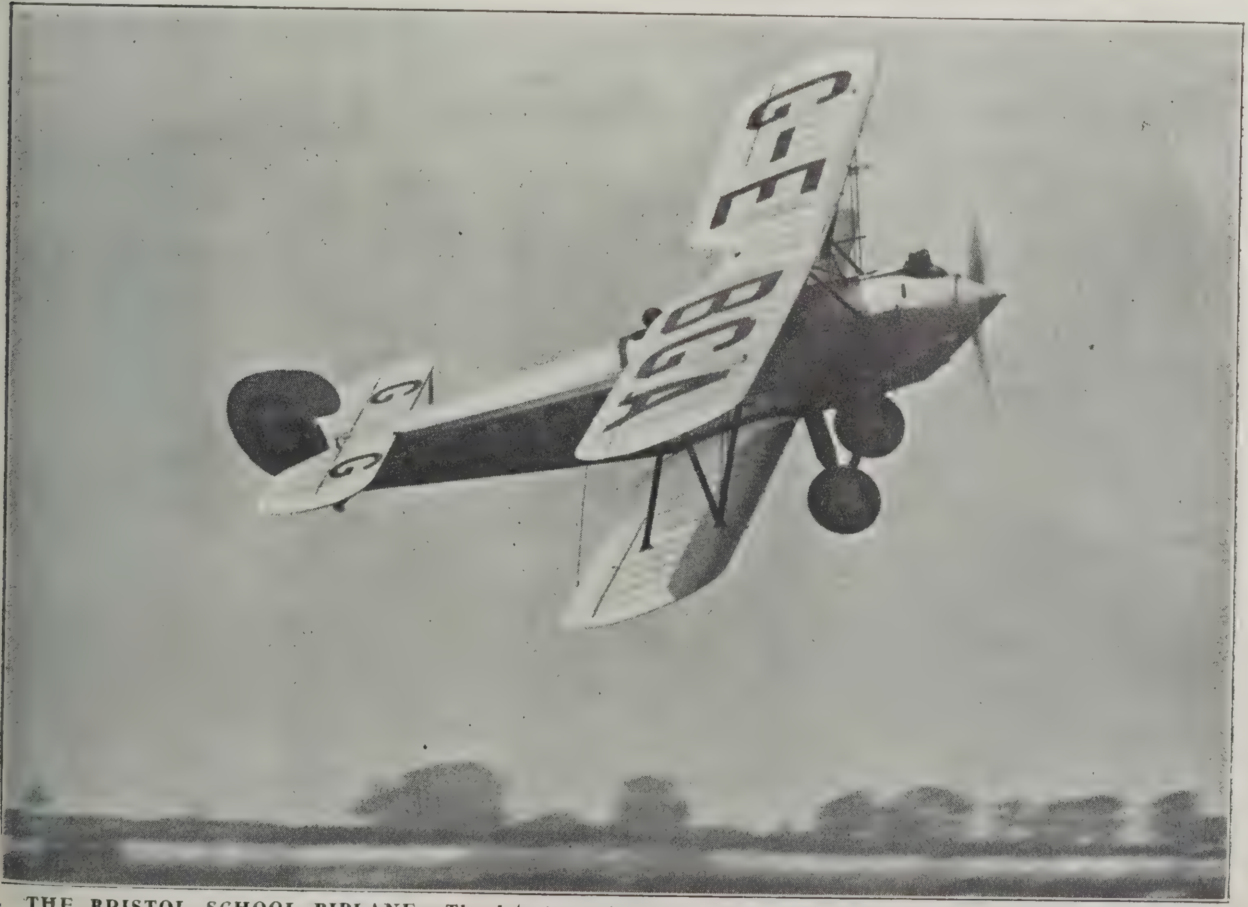
Bearing these two characteristics, a love of fair play and a spirit of adventure, in mind, there is much interest in a letter received from Mr. E. I. Veitch, of the Automatic Control Company, Oakland, California. Although it deals primarily with the history of the Motor Trade, it has a very direct bearing on the development of the Aircraft Trade in Overseas markets. He writes :—

AN AMERICAN'S VIEWS.

Your recent articles in reference to the capture of the World's markets by the American bicycle and motor-car manufacturers have been particularly interesting to me. The controversy which has arisen between yourself and Mr. Fairey is one in which, to my mind, you are both right and both wrong. Permit me at this time to offer a short analysis of the situation in the motor-car industry, with which, here in America, I was connected for some fifteen years.

I do not believe that you quite possibly realise the handicaps under which the manufacturer of motor-cars in England has been compelled to work. The first necessity in the obtaining of high value at low cost in any article is large production. It is vitally necessary to have available markets for the disposal of this production.

These markets are available only when there is a need and desire for the article, coupled with the ability of a large number of persons to pay the necessary price. We, here in America, have been particularly fortunate in having a population so blessed with wealth per capita as to be able to purchase our machines in any quantity up to this time that we have been able to turn out.



THE BRISTOL SCHOOL BIPLANE.—The latest version of the Bristol School biplane (Bristol Lucifer engine), which, piloted by Mr. C. F. Uwins, won the Talbot O'Farrell Challenge Trophy at the Bristol Meeting on May 5 at a speed of 108 m.p.h.—(*"Aeroplane" photograph.*)

This enormous home market has enabled our manufacturers to attain production costs simply phenomenal, and, therefore, has put them in a position to compete in foreign countries with other machines manufactured throughout the world in a most astounding manner. The American market for motor-cars is the only great market in the world, and our manufacturers reside in the middle of it.

The English motor-car manufacturer, on the contrary, has had in his home market only a limited field. His operation costs per car are considerably higher than ours, and your national mental attitude toward the expenditure of savings for the purpose of acquiring what at first appears to be a luxury is decidedly against a very prolific home market.

The American market being shut off from the British motor-car manufacturer by our tariff wall naturally forces him into the development of other territories much more expensive to exploit. His production can never attain the figures that are common to American motor-car production, and he is, therefore, practically defeated before he commences when entering into competition with American machines in foreign lands.

Then, also, the type of roads which were common in America at the commencement of the automobile period were such that American machines had to be built far more sturdily than European cars. In the wilder sections of the globe this characteristic is of immense value to the American product.

I do not believe that the success of the American motor-car manufacturers in conquering the world markets has been due to any lack of initiative on the part of the English manufacturers, but is due very largely to the fortunate conditions for the manufacture of motor-cars here in America, which reflect in our world prices.

You say that the labour costs in England are less than ours. I believe that our high labour costs here in America have been the reason, primarily, for the low cost of our American machines. The reason for this is two-fold. First, the high labour costs force manufacturers to the installation of labour-saving devices which, when in operation, afford immense economies in manufacture. And, second, that the well-paid American workman affords a market unsurpassed for the absorption for the very products which his high wages have compelled to be produced in large quantities at low prices.

This same situation may very possibly obtain in the aeroplane industry, as here in America we are just coming into a marvellous market for aircraft, both large and small.

The recent developments of Mr. Handley Page should, in my estimation, so advance the safety of flying as to render it possible in the very near future for any slightly above average American young man to fly an aeroplane with as little concern as the sub-average person gives to the handling of a motor-car.

Thanking you for your attention to this long letter, and wishing you every success in the continuance of your candid and interesting editorial policy in The Aeroplane.

(Signed) E. I. Veitch.

The Lessons to Be Learned.

One naturally feels complimented in finding that The Aeroplane's sermons attract so much attention in the United States and draw therefrom views which can only be to the advantage of business men on both sides of the Atlantic when read in the right spirit.

All that Mr. Veitch says, in such a kindly and sympathetic way, about the handicaps under which British manufacturers have been compelled to work is just. Certainly the Americans started in the Motor Trade, as they are starting in the Aircraft Trade, with the advantage of having a big home market, and conditions which compel the production of robust vehicles.

But one would suggest that if the British car manufacturer had had more foresight and enterprise, he would have foreseen the possibilities of the markets overseas and would have laid himself out to capture those markets before American mass-production enabled the American manufacturer to get into our Dominions with a ready-made product which fulfilled the requirements of those Dominions. And our British aircraft manufacturers must use just such foresight if they are to capture those same markets before the American machines get them.

The Mass-Production Fallacy.

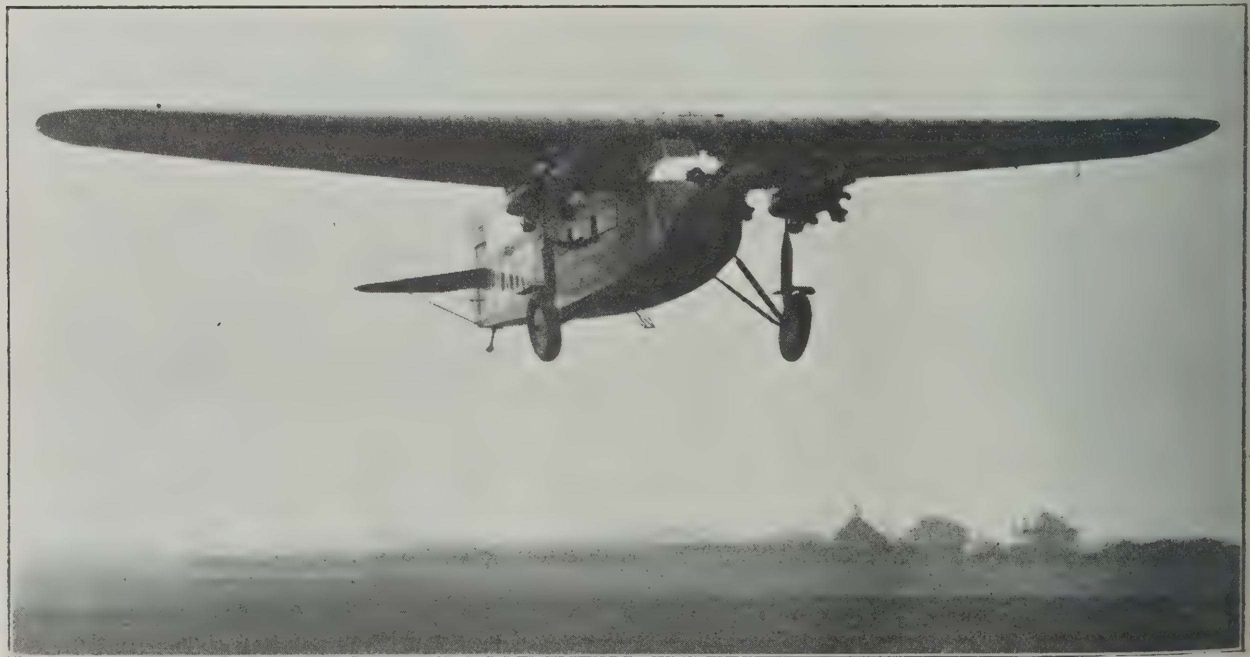
American mass-production does not account for the failure of our motor-cars overseas. After all, mass-production is a relative term. There must be a point at which an increase in output does not cheapen production any further, though it may perhaps reduce dead charges for administration and directors' fees.

What one means is, that the production of a factory reaches its minimum cost when that factory is fully employed. If you have a given amount of machinery fully employed in producing a given amount of parts to keep an assembly-chain fully employed, then if you want to increase your output you can only do so by putting in more machine-tools and another assembly-chain. Which amounts to the same thing as building another factory alongside—or, alternatively, another factory starting up in competition alongside.

Naturally, material can be bought cheaper in very big quantities, but even then there is a limit. One does not imagine that there is much difference in the price per ton between buying ten thousand tons of steel and buying a million tons of steel.

Let us suppose, therefore, that some big English motor-car manufacturer had realised the possibilities of the overseas markets and had laid down a plant for mass-production, and had concentrated on the design of a car particularly suited for the overseas trade, and had entirely neglected the home markets. Then he could obviously have captured the overseas markets before the American manufacturers had got there.

So far as the motor-car is concerned, of course such an operation would probably have been killed by the outbreak of war in 1914. And one is quite ready to grant that



THE LATEST AIR-TAXI.—The latest Fokker monoplane, fitted with three 250 h.p. Bristol Titan engines, which has been hired by Mr. Van Lear Black, the American millionaire, for a series of long-distance air-tours this summer.—(*"Aeroplane" photograph.*)

Proofs of Napier Efficiency!

Speed

The Napier aero engine was fitted to the Supermarine-Napier seaplane which holds the World's air speed record over 100 kilometres—

Speed 283.313 m.p.h.

The Napier aero engine was fitted to the Supermarine-Napier seaplane which won the Schneider trophy for Great Britain in 1927—

Speed 281.6 m.p.h.

Reliability

The Napier aero engine was fitted to the four Fairey-Napier aircraft which on two occasions have flown from Cairo to Cape Town and back—1926 and 1927—

100,000 engine miles

The Napier aero engine was fitted to the Dornier-Napier flying boat which flew from Spain to Buenos Aires—

12,518 engine miles

The Napier aero engine is installed in the four Supermarine-Napier flying boats which are now flying to Australia—

85,000 engine miles

In all above flights not the slightest engine trouble was experienced. No *other engine can point to such a list of remarkable achievements, proving the consistent reliability of the—*

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American cars got into the British Overseas Dominions in larger quantities than they might otherwise have done, because for over three years British car manufacturers were tied down to producing war material. But one is convinced that if there had been no war the American manufacturer would still have got the overseas markets.

MISTAKEN POLICIES.

Even during the war British car manufacturers were allowed to produce experimental cars so as to have new models ready to produce in quantities as soon as the war stopped. And not one of those experimental cars was designed to be of any use for the overseas markets.

Apart from questions of wheel-track and ground-clearance, none of them had enough power, or was robust enough for the overseas trade. And, above all things, none of them had the electrical equipment, ignition systems, four-wheel brakes, or general convenient gadgets which had come to be standard practice on all American cars.

It was not till years after the war that the British car manufacturers thought of turning out cars as fully equipped as even the cheapest of American cars. And to-day American car manufacturers still keep on producing new refinements and new gadgets which are not adopted by English makers until American cars so equipped have found their way onto the English market itself. By which time, of course, they have again captured the trade of the overseas markets for several years ahead.

All this progress in design is not a matter of favourable conditions, or of mass-production. It is simply a matter of brains, foresight and enterprise. And, on top of that, the American firms treat their agents far more generously—or more recklessly—than do British firms.

If British aircraft constructors are to avoid a repetition of just precisely these developments in the history of the motor-car trade they must exercise the brains, foresight and enterprise which has been so conspicuously lacking in the British Motor Trade.

THE OPEN MARKETS.

At the present moment the overseas markets for aircraft are just as open to the British manufacturer as they are to the American. In fact, we have the advantage already in having supplied overseas whatever demand so far exists for light aeroplanes. Moths and Avians are doing more trade in the British Dominions and in other countries than is being done by American civil aircraft.

But even now we are not ready to supply the demand which is beginning to grow for passenger-carrying machines with high performance and comfortable furnishing. So far only one 200 h.p. cabin monoplane of British design exists on paper. America is turning out machines in that class by dozens per week. And already many of them are getting to the British Dominions.

THE TREND OF THE TRADE.

There are signs that the aeroplane market will follow very much the course of the automobile market. Already the Chicago—San Francisco section of the American trans-Continental Air Mail Route is being equipped with machine which carry 1,000 lbs. of mail, two passengers and pilot with engines of about 400 h.p. This corresponds in type pretty well with the De Havilland 61, with Jupiter engine which has been built for the Australian service.

But one now hears that the same air line is about to pu into service similar machines with engines of between 50 h.p. and 600 h.p.—not to acquire higher speeds but simpl to have a bigger reserve of engine-power, and so to ru the engine under easier conditions. That corresponds exactly with the big American cars with under-worked engines which naturally do better overseas than our small cars wit over-worked engines.

Therefore it is up to us to look ahead and forestall al this latest development.

As for the question of labour costs, certainly there is trut in the argument that the high cost of labour in America ha forced the production of labour-saving devices. Necessit is ever the Mother of Invention. But, if we had sufficien foresight in this country we also should concentrate o labour-saving devices, and then, with our cheaper labou our production costs would be far below those in America.

One can only hope that such lessons as are to be learne from America will be taken to heart by our manufacturers.

SALVATION BY SLOT.

The Handley Page Slot certainly ought to lead to all th expansion of aviation foreseen in Mr. Veitch's letter. Th amount of correspondence which one has received personally from America on the subject of the Slot is a clear indication that American manufacturers are now far more aliv to the possibilities of this invention than were British manufacturers even six months ago—in spite of the fact that TH AEROPLANE has been rubbing in the value of the slot devic for the past eight years.

Perhaps one may even take unto oneself credit for th fact that much of the interest shown in the slot by American manufacturers is due to the fact that, again judging b correspondence, American manufacturers take quite as muc interest in THE AEROPLANE as do British manufacturers.

At any rate, if the American manufacturers do succee in flooding the overseas market with big and little slotte aircraft of the type which the overseas market demand, th British Aircraft Industry cannot plead that THE AEROPLAN has not given them fair warning.—C. G. G.

A CANADIAN PACIFIC AIR SERVICE.

On May 5, the Canadian Pacific Express Company inaugurated an air service between Rimouski, Quebec, Montreal, Ottawa and Toronto for the carriage of merchandise, money and securities in connection with the steamer and railway services of the Canadian Pacific Railway Company.

The Canadian Pacific Express Company, which is allied to the Canadian Pacific Railway Company, has the exclusive right of handling merchandise, live stock, money and valuables on the passenger trains of the C.P.R. and the new air service will be used only for the carriage of Canadian Pacific Express traffic.

The service will be operated with Fairchild cabin monoplanes and these will meet the incoming ships at Rimouski, where all Atlantic liners stop to pick up a pilot, and convey goods by air to Quebec, Montreal, Ottawa and Toronto. It is estimated that by the use of this service goods and packages will be delivered in Quebec, Montreal, Ottawa and Toronto with a saving in time of 8, 11, 15 and 18 hours respectively over the time normally taken by steamer and train.

The decision of the Canadian Pacific Express Company to operate an air service is an extremely important one and represents the first effort by a company at present concerned with railway and steamer traffic to consider seriously the possibilities of air transport as an aid to land and sea transport.

At present it is not intended to use the service for the carriage of passengers, but there can be little doubt that the results of this experiment will lead to developments of a far-reaching nature.

No better locality could have been chosen for this initial experiment. The distance from Rimouski to Toronto is 660 miles, the route following the St. Lawrence River and Lake Ontario, an ideal one for aeroplanes, with excellent landing facilities in summer and winter and no high country to fly over.

During the winter months when the St. Lawrence is frozen over the C.P.R. ships use Halifax. During the past winter the Canadian Department of National Defence made an investigation of a winter air route between Halifax, St. John and Montreal, through the northern part of the State Maine, for the C.P.R., so that it may be assumed that th service will be operated all the year round.

Landplanes will be used, on wheels in summer and sk in winter. It was proved last summer that owing to storn weather conditions and the lack of a suitable shelter anchorage at Rimouski seaplanes were unpracticable. this must be added the impossibility of using seaplan during the thaw and the freeze-up in the spring and the fa

JACQUES SCHNEIDER.

The death is announced at Beaulieu, S. France, of Jacques Schneider, the donor of the Jacques Schneider Se plane Trophy, and a well-known pre-war aviator.

M. Schneider was a member of the famous family of arm ment manufacturers, an enthusiastic sportsman and pione of aviation.

He obtained his aviator's certificate in 1909 as a pupil M. Louis Bleriot, and he also held an aeronaut's certifica for the pilotage of free balloons.

In 1913 he presented to the *Aéro Club de France* the n famous Schneider Trophy.

In nine contests so far held the speed of the winni seaplane has increased from 44.7 to 281.48 m.p.h. Denud of bare figures, this increase represents a remarkable p gress in aeroplane and engine design, a progress that co not have been obtained in so short a time but for the fo sightedness of M. Schneider which prompted him to prese a trophy for seaplane competition.

Although living in comparative seclusion in the South France, M. Schneider retained his interest in aviation to t last, and at the time of his death he was a member of t Executive Committee of the *Aéro Club de France*.

By his death France loses one of her most honoured p neers, and one who has contributed very largely to t progress of high-speed aviation throughout the world.

Sir Samuel Hoare, Secretary of State for Air, has se the following telegram to the *Aéro Club de France* :—

> Air Council deeply regret to learn of death of M. Schneider, do of the International Seaplane Trophy. They would be grateful you would convey to relatives an expression of their sympathy.

FAIREY

AIRCRAFT

LONDON'S NEW AIRPORT.

The new buildings at Croydon Aerodrome were officially opened on May 2 by Lady Maud Hoare, D.B.E. The ceremony was attended by a very representative gathering of officials of the Air Ministry, of both British and foreign aircraft operating firms and of the British Aircraft Industry.

Sir Samuel Hoare, Secretary of State for Air, accompanied by Lady Maud Hoare, arrived at the aerodrome punctually at 15.30 hours. They were received at the entrance to the main administrative block of buildings by Sir Sefton Brancker, Director of Civil Aviation.

Lady Maud Hoare then unveiled a bronze tablet at the entrance to the administrative building, commemorating this opening ceremony, and thereafter unlocked the door and declared the building open.

In a short speech Lady Maud expressed her pleasure that London's terminal aerodrome was at last provided with worthy and comfortable facilities for passengers. As an air passenger of some considerable experience she could speak as to the importance of such accommodation. She had vivid memories of landing at some place which should be nameless after a very bumpy and unpleasant journey, feeling in a very damaged condition. On her arrival she was received as hospitably as the resources of the aerodrome permitted, and she was very kindly offered some cold soup. At the time and under the conditions she could only feel that the said soup must be nearly related to engine oil. For this reason she was specially glad to find that a really good hotel was one of the amenities of the new aerodrome.

Sir Samuel Hoare said that the new aerodrome was at least as well equipped and arranged as any aerodrome in Europe. The growth of traffic in and out of Croydon was proceeding at a rapid rate. During one week in July, 1927, nearly 1,400 passengers passed through the aerodrome. During the Easter period this year 1,600 passengers passed through as against 1,100 in the corresponding period last year. Imports of goods by air into Britain last year reached the value of £1,250,000, an increase of 100% since 1920, and exports for the same year stood at £1,450,000, an increase of 300%. Nearly £26,000,000 worth of bullion had been flown into and out of Croydon in the past three years.

In the past three years British Air Lines had flown 2,500,000 miles without any accident leading to injury of any passenger, and passenger traffic on these lines was now three times as heavy as it had been three years ago.

During the past few days he had signed the heads of an agreement between the Government and Imperial Airways for a regular weekly service from Croydon to India, and he hoped that within the next few years visitors to the aerodrome would see machines arriving from and leaving for the distant capitals of the Empire with the same regularity and punctuality as they now did for the capitals of Europe.

Thereafter Sir Samuel and Lady Maud Hoare, followed by the assembled company, inspected the buildings and a parade
of aircraft representative of the fleets of all the air line
operating from Croydon. After the inspection tea was serve
in the new hotel.

Among the many people well known in aviation circle
who were present were Lord Weir of Eastwood, who, a
Secretary of State for the Royal Air Force was the firs
British Air Minister, and Lord Thomson of Cardington, Secre-
tary of State for Air under the Labour administration c
1924.

The British Aircraft Industry was represented by Cap
P. D. Acland, Chairman of the S.B.A.C., Mr. Robert Blacl
burn, Mr. C. R. Fairey, Capt. de Havilland and Mr. A. V
Roe. Col. the Master of Sempill, President, and Mr. J. I
Pritchard, Secretary, represented the Royal Aeronautica
Society, and Col. Sir Francis McClean and Mr. Perrin, th
Royal Aero Club.

A notable foreign visitor was Mr. Plesman, general manag
of the K.L.M. air line, who has not, one believes, previous
visited Croydon since the new buildings have come in
use

THE NEW BUILDINGS..

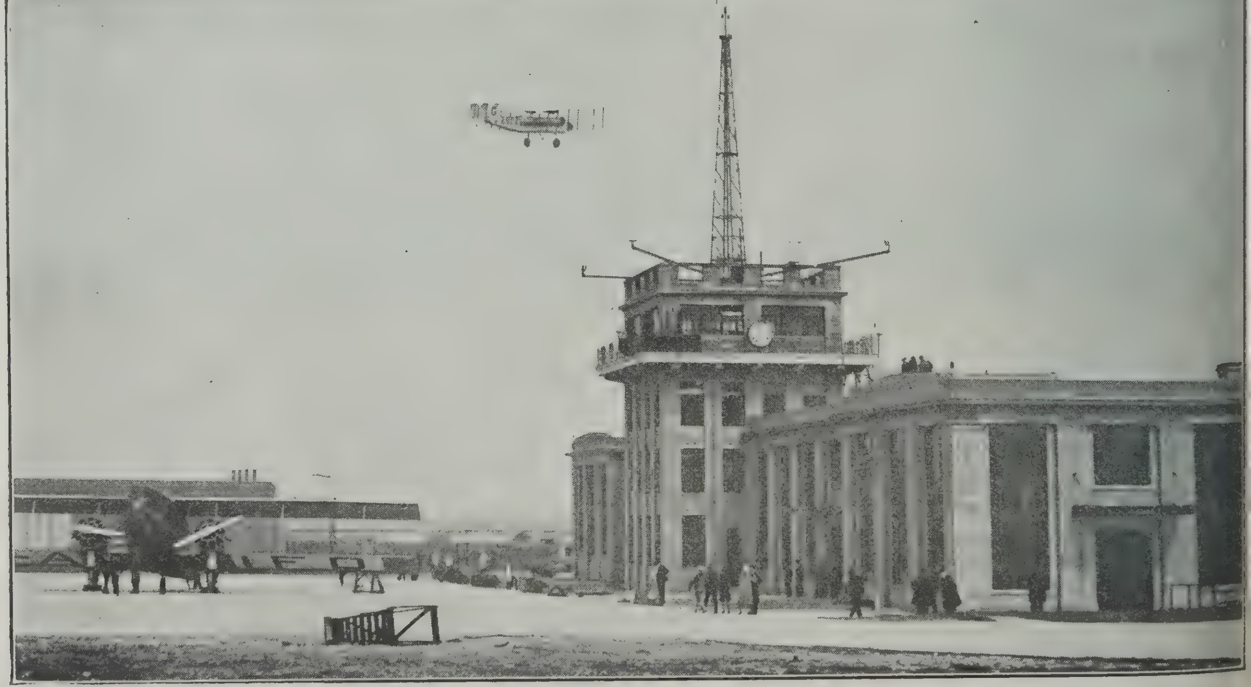
The most important of the new buildings at Croydon is th
central administrative block wherein are housed the offic
of the aerodrome administration, a booking hall and loun
for passengers, Customs station, etc.

All air passengers must pass through this building, ther
fore special care has been taken in the layout and decoratic
of this section to produce a dignified and pleasing appea
ance. So far only one criticism of these buildings has con
to light—that made by an American visitor to the effect th
the new buildings were too much like a typical Americ
railway terminus to please him.

The general scheme of the administrative building is w
shown by the plan reproduced on page 660. It lies well ba
from Purley Way and is approached by wide sweeping ca
riage ways, eventually to be bordered by flower-beds a
lawns. The central entrance leads directly into the ma
hall of the building. This is a lofty room about 60
square, lighted by a central glazed dome.

Opening on to this main hall there are alongside the e
trance on the one side a post and telegraph office and on t
other a bookstall. On the two sides are the booking and
quiry counters of the various air lines, with behind them e
closed offices. These offices reach to the outer walls of th
section of the building, have very large windows, and a
divided off from the hall proper by frosted glass partitio
so that a great deal of light is admitted to the hall from t
two sides as well as from the dome overhead.

At the end of the hall opposite to the entrance are two se
of swing doors, those on the right for outgoing and those
the left for incoming passengers. Between these two se
of doors is a large wall map of the air line routes radiati
from Croydon whereon are posted the latest reports of weath



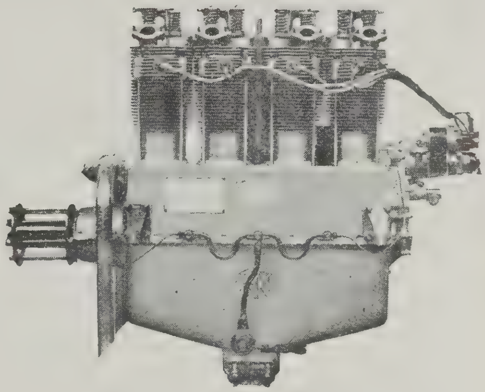
THE NEW AIRPORT OF LONDON.—The Administrative Building from the tarmac, showing the Control Tower. Passing the control tower is the 12.30 Argosy, just leaving for Paris, and on the ground is an Air Union Lioré and Olivier "restaurant car" machine due to leave at 12.45.—(*"Aeroplane" photograph.*)

THE HON. LADY BAILEY FLIES SOLO FROM ENGLAND TO CAPETOWN ON A "CIRRUS" ENGINED "MOTH" LIGHT AEROPLANE

The Hon. Lady Bailey.

"The greatest aerial"
"feat yet performed"
"by a woman."

(Vide Daily Press.)



30/80 h.p. A.D.C. "Cirrus."

Some facts which make this a noteworthy flight:—

(1.) This is the longest flight ever completed by a lady pilot flying her own machine.

(2.) Lady Bailey was flying solo in a "Moth" Light Aeroplane with a "CIRRUS" engine of only 30/80 h.p. on this journey of 8,000 miles across Europe and Africa.

30/80 h.p. "CIRRUS" engines are the only Light Plane engines on which World Flights have been successfully accomplished and they were chosen by:—

Sqdn.-Ldr. HINKLER, A.F.C., D.S.M.	ENGLAND—AUSTRALIA—16 DAYS.
Capt. W. N. LANCASTER	ENGLAND—AUSTRALIA (with passenger).
Lt. R. R. BENTLEY, A.F.C.	LONDON—CAPETOWN. Solo.
Capt. T. NEVILLE STACK, A.F.C. and B. M. S. LEETE, Esq., A.F.C.	LONDON—INDIA (KARACHI).

and

Capt. H. S. BROAD, A.F.C.	1st KING'S CUP AIR RACE 1926
Capt. W. E. HOPE	1st KING'S CUP AIR RACE 1927.

Etc., etc.

CIRRUS ENGINES ARE MANUFACTURED BY

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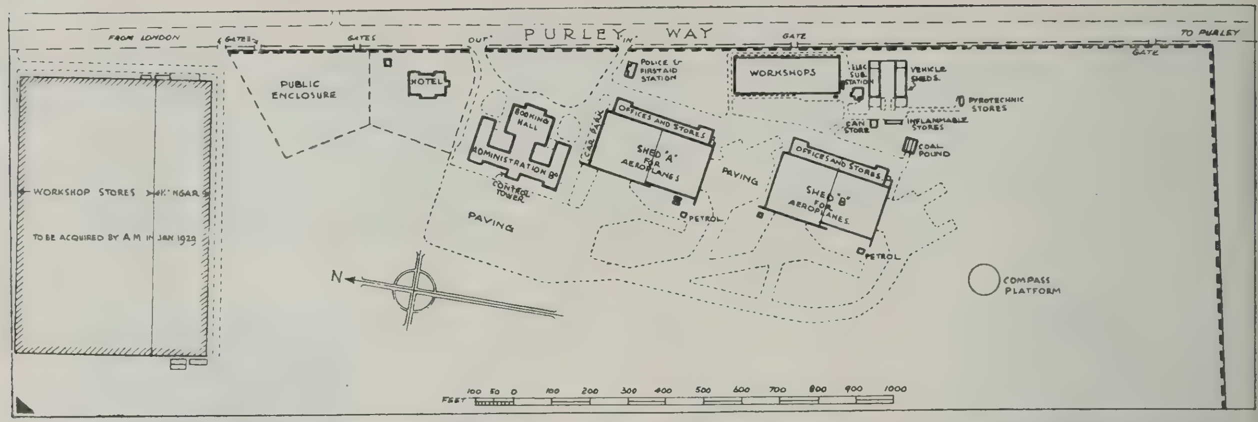


LONDON'S AIRPORT.—A plan showing the arrangement of the new permanent buildings at Croydon Aerodrome.

conditions from all stations on the route as well as copies of the latest weather forecasts issued by the local meteorological officer and by the chief Continental stations.

In the centre of the hall is a sort of truncated obelisk with eight faces each bearing two clock dials and notice boards whereon the times of arrival or departure of the next aircraft due on each of the various services are displayed.

Lying to one side of the exit for departing passengers and along the side of a passage leading to one external court is a buffet bar where passengers may obtain any form of light refreshment they may require. On the opposite side by the entrance for incoming passengers is a ladies' waiting room.

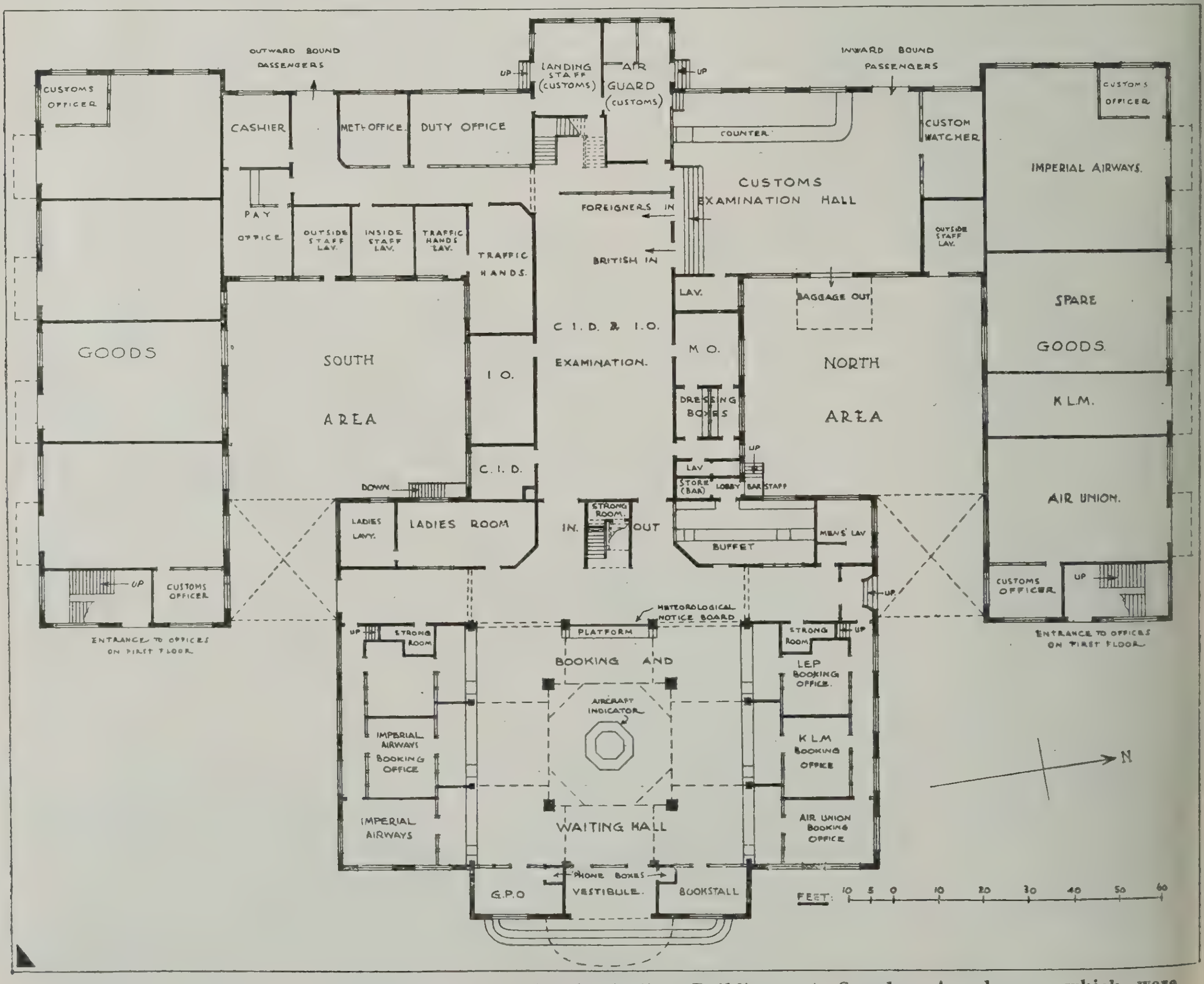
Running all the way round the hall, and above the booking-office counters is a balcony, onto which open small private offices allocated to air line officials, etc.

The main hall is parquet-floored, furniture and fittings are in polished light oak, and what there is of wall is white. The whole effect is simple but quite decidedly impressive.

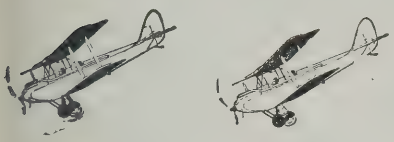
The doors for outgoing and incoming passengers lead into a long relatively narrow hall where the police and immigration officials perform their functions, passports are examined, and the like. This hall is by no means as lofty or as well lighted as the main hall, and by contrast therewith seems gloomy. This is perhaps a fitting reminder to the passengers that even air travel is not completely free from irksome formalities, but even if the architect had this aim in view he at least has made this section of the building pleasing and cheerful in aspect when compared to the accommodation provided for these purposes at Dover or any of the other southern ports of arrival from the Continent. Offices for the officials concerned are on each side of this hall.

Outgoing passengers leave this hall by a passage way t the left coming from the entrance, and pass directly to th "tarmac." Incoming passengers enter it through a Customs examination room on the opposite side. All this section o the building has been laid out for handling traffic o a much larger scale than exists to-day, and consequentl there is usually a somewhat deserted air about it.

On each side of the central passage along which passengers pass is a parallel line of buildings, coupled up to the centra



LONDON'S AIRPORT.—A ground plan of the Administrative Buildings at Croydon Aerodrome, which were officially opened on May 2 by Lady Maud Hoare, D.B.E.



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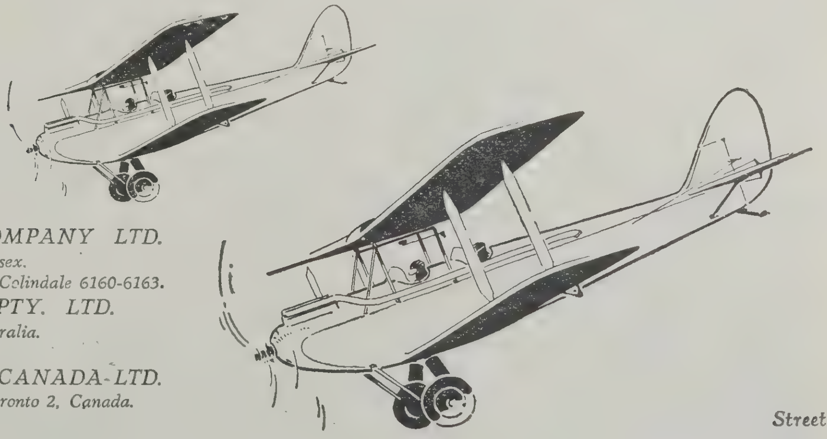
BRITAIN'S LATEST FLYING CLUB–THE CINQUE PORTS ADOPTS

THE MOTH

BEHIND the Moth there is a unique experience of more than three years of world-wide use, during which time two and three-quarter million miles of flying have been covered. This experience is reflected in the development of every feature of its design, and in its carefully balanced characteristics. It is on this account that an ever increasing number of Flying Clubs and Schools throughout the World is adopting the Moth . . . its unequalled performance and *known* reliability has earned it the reputation of being "The Ubiquitous Moth."



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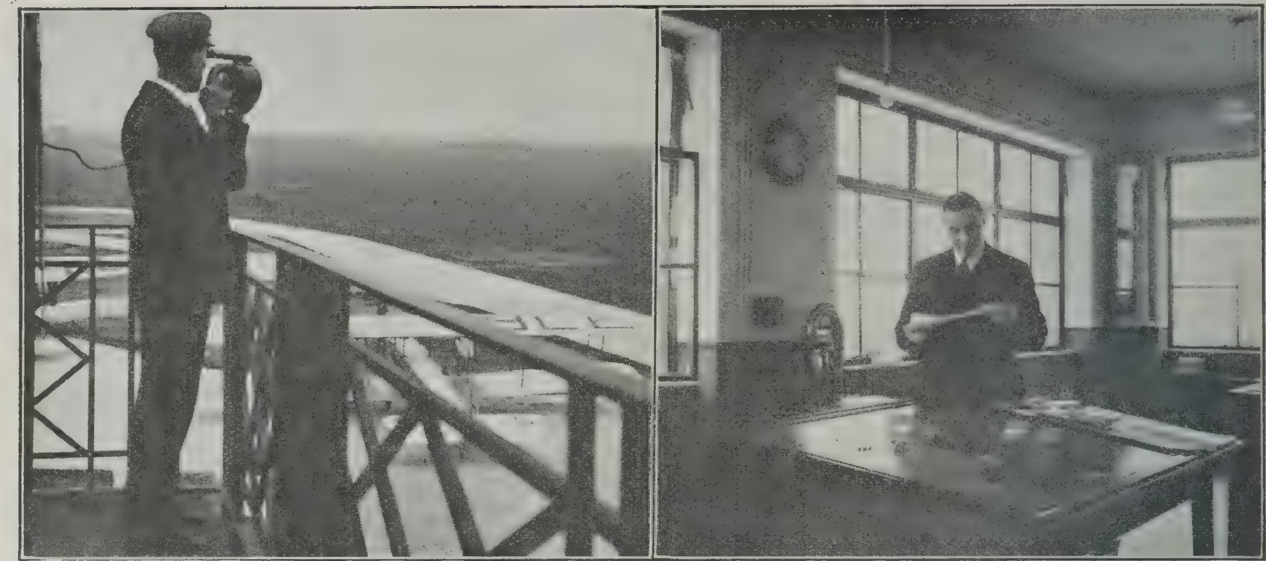


THE CONTROL TOWER.—On the right the Traffic Control office with the officer on duty standing in front of the route map whereon the position of all aircraft is kept posted. On the left a view from the gallery outside the office showing a signal being sent by Aldis lamp to an aircraft waiting permission to take off.—(*"Aeroplane" photo.*)

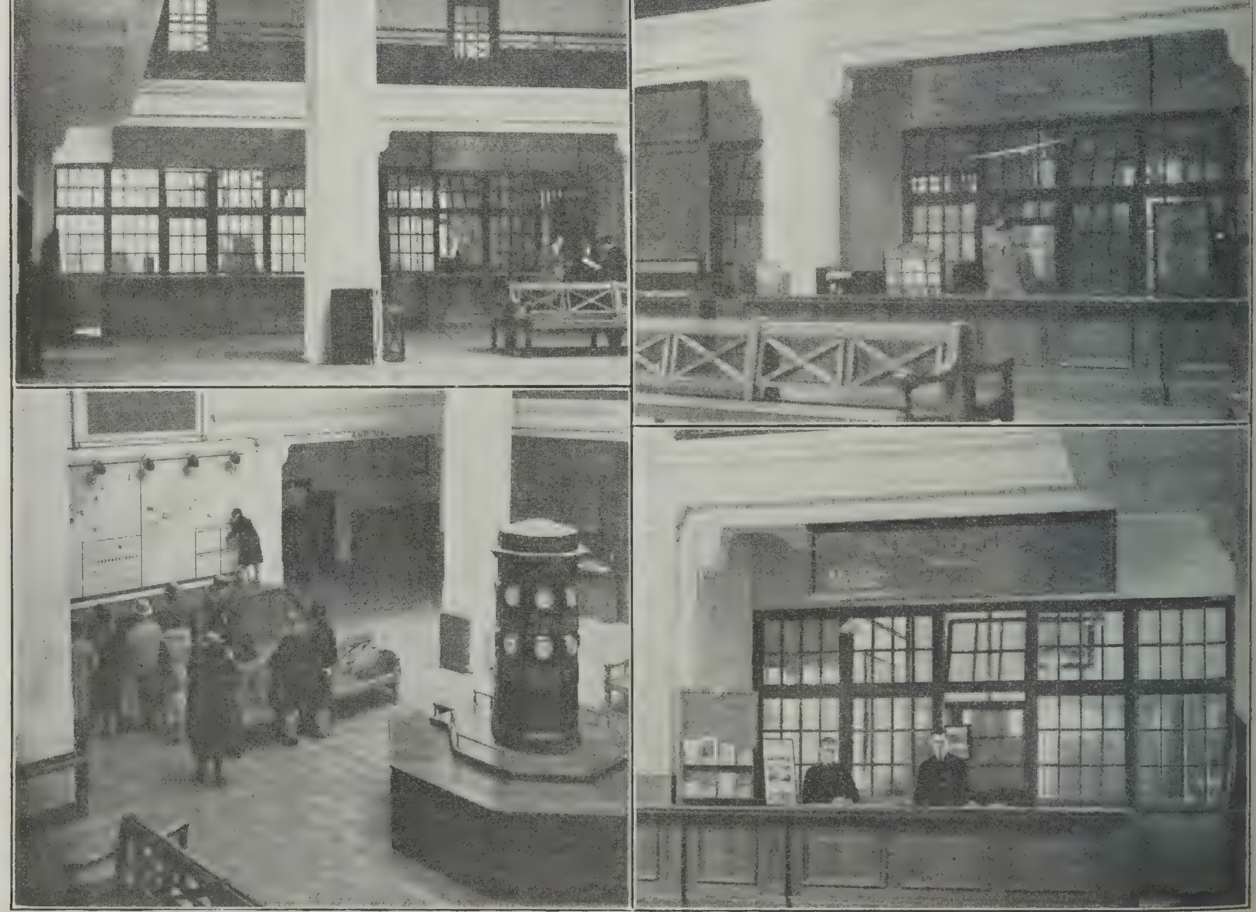
section on the side facing the aerodrome, but leaving a square internal court approached by an archway from the front a little behind and to each side of the booking hall. In these side bays are bonded stores for goods, together with offices for Customs officials and other necessary functionaries.

Except for the central booking hall this building is arranged in two main stories. The upper storey is given over to a perfect maze of offices, wherein are housed, as already mentioned, some air-line officials, and in addition there is provided accommodation for a vast number of aerodrome officials of one kind and another.

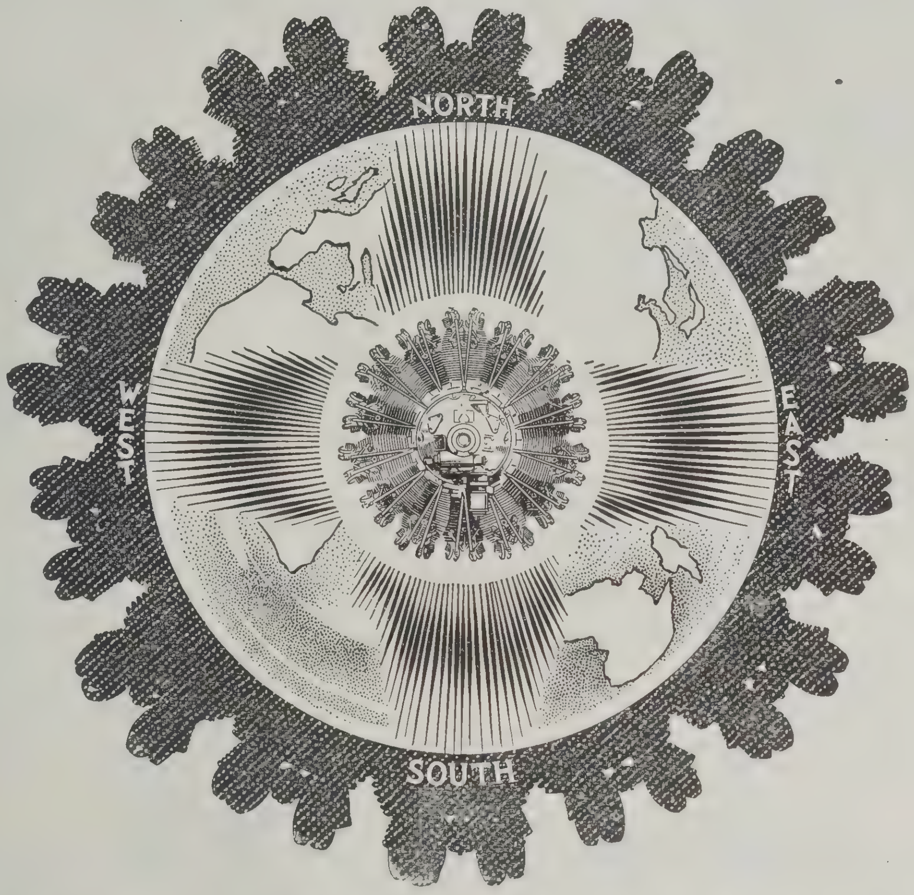
Rising another two stories and projecting out somewhat from the aerodrome face of the main section of the building is the control tower. On the top of this is mounted the direction-finding aerial.

The control room proper is immediately below the roof of the tower. This room is 30 ft. square, has windows on all sides, and is surrounded by a balcony. Internally it is divided into two sections by glass partitions. The inner section contains the receiving and the transmitting control gear for wireless, together with the gnomic chart for plotting wireless bearings and thus fixing the position of aircraft.

The outer section is the office of the traffic officer on duty. From here is controlled the actual landing and taking off of aircraft on the aerodrome, by means of the display of various coloured metal discs, by optical signals through an Aldis



THE PASSENGERS' WAITING HALL.—In the top left corner is shown Imperial Airways booking office, and on the right the K.L.M. office. In the bottom left corner passengers are looking at the weather map, while one of the Meteorological staff is posting the latest weather report. This picture also shows the arrival and departure notice board. In the right bottom corner is shown the Air Union office.—(*"Aeroplane" photograph.*)



A WORLD WIDE REPUTATION

THE greatest flights of Cobham and Koppen to and from the East Indies, Australia and South Africa have proved the reliability, ease of maintenance and economy of running of the Armstrong Siddeley Aero Engine.

These four models are now in use in 20 different countries of the world:

14 cyl. 385-425 h.p. Jaguar.	5 cyl. 125 h.p. Mongoose.
7 cyl. 200-225 h.p. Lynx	5 cyl. 80-88 h.p. Genet.

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FLOWN AND KNOWN ALL OVER THE WORLD

A 61

lamp, the firing of Verey lights, or of rockets. In this office are placed the switches for the control of the aerodrome obstruction lights, the sunken landing lights, and the Neon beacon.

The officer on duty receives from the wireless operators alongside him all messages received from aircraft in flight, and as a result of these messages he is able to register the approximate position of any commercial aircraft along the routes which are under British control. He has for this purpose a map of these routes, painted on a steel sheet, and he is provided with a series of magnetised arrows bearing identification marks corresponding to those of aircraft. These are placed on the map in the correct positions, and moved from time to time as information comes to hand. Thus he has before him a graphic picture of the state of affairs on all the routes under his control. In weather of bad visibility he can see at once if two machines are approaching each other dangerously closely, and can issue a warning of that fact by wireless to the pilots concerned.

The traffic officer is in direct communication with the Meteorological Office by pneumatic tubes. All routine weather reports come to him at once, and any special inquiries can be attended to without delay. There is also a pneumatic tube connecting with the aerodrome Duty Office, which receives all messages relating to the arrival and departure, etc., of aircraft from aerodromes, as distinct from the messages transmitted from the aircraft themselves which are received directly at the control tower. Over and above these pneumatic tubes the control tower is in ordinary telephonic communication with all the air line offices and aerodrome officials.

A traffic officer is on duty continuously during the whole period during which any aircraft is flying over the British sections of the air routes. In addition there is always a traffic officer on the premises who may be called up for duty in the event of an unexpected arrival of a machine on the British routes, and for this purpose proper sleeping accommodation is provided close to the control tower.

SHEDS.

Two large sheds each divided into two bays by substantial permanent partitions are provided south of the administrative buildings along a roadway parallel to Purley Way. These sheds are of steel and concrete, provide 90,000 sq. ft. of floor space, and at present give ample accommodation for the machines of all the air lines likely to use Croydon for some time to come. Each of these sheds has an overhead runway capable of carrying loads of up to two tons, to facilitate the removal of engines, etc., from machines. In the shed buildings themselves, but separated by permanent partitions from the shed space proper, are a series of offices and store-rooms lying along the before-mentioned road. Between this road and Purley Way are a police station, first-aid room, workshops, garages, and sundry stores. The whole arrangement is shown on a second plan which is reproduced.

In addition to the new sheds, the three bays of the permanent shed in the old Waddon Aircraft Factory, now mainly occupied by A.D.C. Aircraft Ltd., have been taken over by the Air Ministry. In part of this, Surrey Flying Services Ltd. are now established. It is understood that if and when necessary the Air Ministry will take over the whole range of this shed accommodation.

THE HOTEL.

A little to the south of the administrative building is the new Aerodrome Hotel, which has just been partially opened. By itself this is quite a good-looking building, but for some reason, one which does not altogether look as though it belonged to the rest of the buildings. In part this is probably due to its being relatively high and relatively square, whereas the administrative building and the range of sheds both produce a long low effect. It is not yet completely clear of scaffolding and therefore may eventually fit into the scheme of things better than it seems to at present. Neither is it completely equipped internally as yet. So far as it is complete however it is excellent, and when teas and lunches can be served either on the lawns which are to surround it or on its own roof—which is flat and gives a view over the aerodrome equal to that obtainable from the control tower, Croydon aerodrome should become a popular place of resort and a really effective centre for the propagation of air-mindedness.

FLYING UNDER DIFFICULTIES IN CANADA.

On or about Jan. 14, 1928, Capt. K. F. Saunders, Manager of the Flying Division of Fairchild Aviation Ltd., of Grand' Mère, Quebec, was called upon to take Mr. Hodkinson, an Inspector of the Hudson's Bay Company, on a round of some of the company's posts in northern Quebec, a trip which usually takes six weeks on snow shoes using a dog team to carry the baggage.

The country between these posts is entirely uninhabited, the snow ranges from four to six feet in depth, and the temperature from twenty to fifty degrees below zero. The trails for the most part follow rivers and lakes, the country is very broken and the timber small. In many cases there are large burned-over areas across which the wind sweeps with great force cutting out in the snow gullies several feet deep.

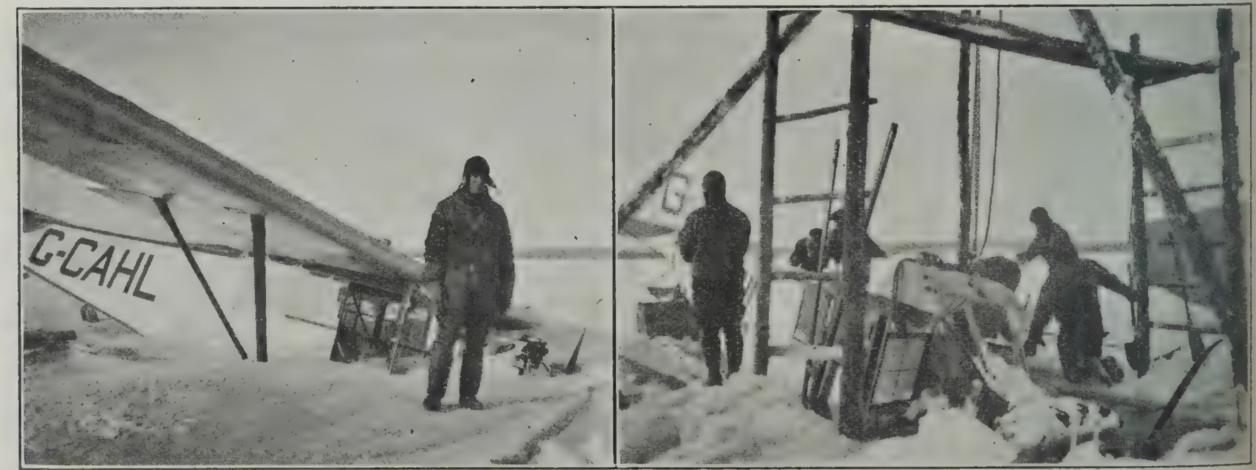
Capt. Saunders left Grand' Mère in fine weather with the thermometer at twenty below in a Fairchild cabin-monoplane (Wright Whirlwind engine) fitted with skis and reached Roberval, on Lake St. John, in 1½ hours' flying.

The next day he left for Lake Ashouapmouchouan, an outpost of the Hudson's Bay Company, carrying Mr. Hodkinson and Mr. George Low, Resident Engineer of the Duke-Price Company, as passengers, together with a load of equipment including snowshoes, blankets, and emergency rations. They followed the Ashouapmouchouan River, passed over Pointe Bleue and the Monastery of La Trappe, and after about an hour's flying sighted the lake on which the Post, their first point of call, was located.

Circling to look for a good landing-place they came down but as the machine touched the snow Capt. Saunders realised that it was very soft and that if he once let the machine settle it would probably stick about a mile out in the lake. He opened out the engine and skimmed over the snow to a point nearer the camp. Here he let the machine settle but when just preparing to get out realised that it was sinking. By this time water was pouring into the cabin and the occupants had just time to get out with their baggage, before the machine tilted sideways and sank until the port wing touched the ice.

This state of affairs in spite of the sub-zero weather was caused by an abnormally early and heavy fall of snow which prevented the ice from thickening

Capt. Saunders proceeded to the cabin post and immediately decided to send for help. The Indian in charge of the Post volunteered to go back to the base with a message,



CANADIAN CONDITIONS.—The Fairchild monoplane in the ice. On the right the machine is ready for hauling out. Both pictures show the extent of immersion of the Wright Whirlwind engine, the Reed airscrew and the cabin.

Lady Bailey's Achievement

FIRST LONDON-CAPE SOLO FLIGHT BY LADY PILOT

Petrol *and* Oil *by* SHELL

Lady Bailey, piloting a De Havilland "Moth," Cirrus Engine, and using standard Shell products—Shell Aviation Spirit and "Golden Shell" Oil—has flown from London to Cape Town—the first time this flight has been made by a woman. This is also the longest solo flight ever accomplished by a woman.

Great pioneer flights accomplished by the aid of Shell products:

The first West-to-East Atlantic Flight (1919)
The first London-Australia Flight (1919)
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The world's leading aviators rely on Shell for dependable speed and power.

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CANADIAN CONDITIONS.—On the right Pasmore and Kehre are erecting the lifting tripod, and on the left the machine is seen after being lifted clear of the ice with the canvas shelter over the engine under which Kehre worked on the engine.

which read " Plane went through the ice total loss, send another at once," and he left at once for civilisation 100 miles away.

Capt. Saunders then went out and sounded through the ice. He found that it was only two inches thick, that the starboard ski was resting on a ledge on the bottom of the lake in about four feet of water and that the port ski had twenty feet of water under it. It was thereupon decided to lay a platform of logs around the machine which would keep it from sinking further and would serve as a base for a tripod on which eventually to rig a chain block lifting gear. Cutting the necessary logs took a whole week of hard work in biting cold weather.

On the Sunday afternoon one of the Indian boys announced that he heard an aeroplane, but it was some minutes before it was actually heard by the rest of the party, whose ears were not so sharp as those of the Indian. This machine turned out to be a relief plane, another Fairchild monoplane, piloted by Mr. Pasmore, carrying the Fairchild chief mechanic, Bill Kehre, and the Indian who went out for help, together with hoisting tackle, tools and provisions.

The next day a start was made by erecting a tripod over the sunken aeroplane, after which the machine was partly dismantled by taking off the wings and one ski, the latter job having to be done under water, in a temperature of minus 40 degrees. Thereafter the engine was taken apart to get the ice out. It took nearly a day to take off each cylinder, and the tools froze to the mittens or even to the hands, if touched without gloves. The work was done in the shelter of a little piece of canvas with two blow torches, which although it kept off the wind only seemed to intensify the cold.

Finally the tripod was ready, poles were laid over which to slide the skis, the ice was chopped out round the machine and the hoisting began. It was necessary to keep chopping constantly as the water froze almost as fast as it was chopped out. The machine weighed over a ton and had in addition 22 inches of ice in the cabin. Finally, with great exertion, it was hauled clear of the ice, and after temporarily attaching the skis the machine was dragged over to the shore.

The wing whose tip was under water was taken to the store room, two stoves lighted and the fabric opened to take out the ice. This proved to be a difficult task, as the room could not be got warm enough to melt the ice and most of it had to be chipped out with a screwdriver after which new fabric had to be put on.

The engine parts had to be thawed out piece by piece, and it speaks well for modern manufacturing methods to know that the Wright Whirlwind engine, equipped with a Scintilla magneto and a Stromberg carburettor, remained frozen in 14 inches of solid ice for eight days and after being thawed out and re-assembled flew the machine back to its base without any replacement and with no damage other than a slight crack in the carburettor. The Curtiss-Reed propeller struck the ice before the engine had completely stopped, bending the tips badly. These were straightened out and the airscrew was used to bring the machine back without any trouble. Meanwhile Mr. Pasmore had flown Mr. Hodkinson to the Post at Lake Chibougamou. This trip usually takes six days in the regular way, but was made in 35 minutes by air.

After the inspection was made it was found impossible to take off on account of the soft fluffy snow into which the skis sank almost up to the fuselage, but by good fortune thre Indians had come into the Post that day and they, with th two already there, were just able to push the machine unti it got up enough speed to take the weight off the skis.

In spite of the experience of the Fairchild Company wit three years' winter flying in Canada, conditions in this par of the country were entirely different from anything they ha seen before. The snow was very fine and in the open an on the lakes was packed hard and cut into irregular gulley from two to four feet deep and often too wide to be bridge by skis. On taking off with the engine full out it was onl by having at least five men to push it that it was possible t start to taxi with even the lightest possible load. Eve with the engine completely cowled and the oil tank and al connecting oil lines covered with asbestos the oil temperatur could only be raised to 70°. The petrol got so cold that i would not light unless a match was held to it for some tim and then it burned very slowly with a sooty flame unti enough heat was generated to vaporise it.

While they were engaged in salving the sunken aeroplan the relief machine made several trips back to Roberval bring ing back needed supplies and a husky sled dog, as M Hodkinson thought that he might continue his trip to on more Post before returning.

Finally all repairs were finished, the wings put on and th ice thawed out of the plane as much as possible by puttin a blow lamp in the cabin and shutting the doors. It was the found that they had not enough petrol for the return journe Pasmore again took off for Roberval and next day returne with sufficient petrol. The salvaged machine having bee tested and found satisfactory, Capt. Saunders and Mr. Pas more set out for Roberval and civilisation in formatio where they arrived after one hour and five minutes' flyin and on the following morning returned to their base a Grand' Mere.

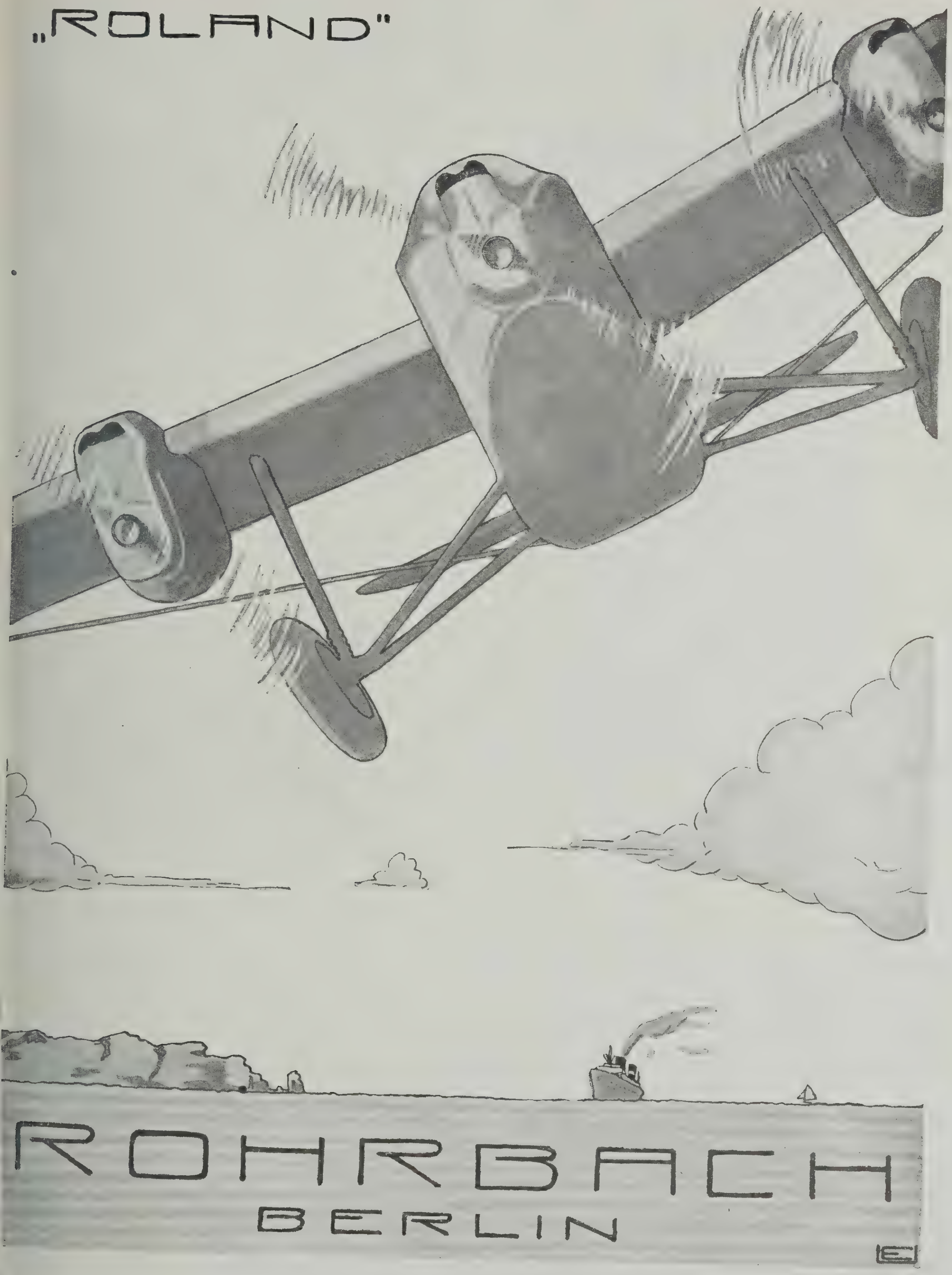
AIRCRAFT PURCHASES IN CANADA.

According to *Air Transportation,* of New York, Mr. Jack Elliott, of Hamilton, Ont., who has been operating a flyin school in that city for several years, has been appointed a authorised agent for the Swallow Airplane Co., of Wichit Kansas. He plans to take at least thirty Swallow biplane this year and he purchased four at the recently-held Detro All-American Aircraft Show. He is also reported to hav bought two Fokker Universal monoplanes at the same Show

A company known as the Purple Label Airlines Ltd., Calgary, Alberta, has purchased a Stinson Detroiter mon plane (Wright Whirlwind engine).

Western Canada Airways, of Winnepeg, are reported have bought six Avro Avians with which a flying school wi be inaugurated. This company has also ordered five Fokke Universal monoplanes (Wright Whirlwind engines) for us on their services in Ontario and Northern Manitoba. Thi order is in addition to their previous one this year for eigh Fokker Universal and four Super-Universal monoplanes.

B.C. Airways Ltd., of Victoria, B.C., has purchased a 1 seater Ford monoplane (three Wright Whirlwind engines This machine is for use on a Victoria—Vancouver—Seattl air service which the company planned to begin operatin on May 1. This service will connect with Pacific Air Trans port Inc., which operates the Seattle—Los Angeles ma route under contract with the U.S. Post Office.



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There are many good aeroplanes in commercial service in all parts of the world. But there are some aeroplanes which are superior because they have shown an actual performance which seems unbelievable even for those "who know."

Establishing 22 World's Records, the ROHRBACH "ROLAND" placed itself among the leaders.

THE ROYAL AIR FORCE.

The London Gazette.

May 1.

General Duties Branch.—The following are granted S.S. comns. as Plt. Offs. on probation with effect from the dates indicated, and with seniority of April 13:—F. R. Balfour, C. G. Davies (April 18); E. L. Johnstone (April 19); M. N. Oxford (April 20).

Wing Cdr. A. J. Miley, O.B.E., ceases to be seconded for duty with the Chilean Navy (April 1).

Stores Branch.—Flg. Off. M. H. Jenks is granted a perm. comn. in this rank with effect from May 30, 1927, on completion of probationary service; Plt. Off. on probation P. H. Wilcox is confirmed in rank and promoted to the rank of Flg. Off. with effect from Oct. 30, 1927, and with seniority of Oct. 9, 1927.

Accountant Branch.—Flg. Off. G. R. Keep is transferred to the Reserve, Class C (April 28).

Medical Branch.—Flt. Lt. T. K. Place is promoted to the rank of Sq. Ldr. (Dental) on promotion to Major in the Army Dental Corps (April 4) (substituted for the notification in the *Gazette* of April 24).

Legal Branch.—Flt. Lt. G. S. Marshall, O.B.E., is granted a perm. comn. in this rank (May 2).

Reserve of Air Force Officers.—General Duties Branch.—Flg. Off. J. C. Jeffrey, M.C., is employed with the Regular Air Force for a period of two years (April 16). The following are granted comns. in Class AA as Plt. Offs. on probation (April 16):—S. A. Adams, T. G. Jones, W. R. Walwin. Plt. Off. R. S. Munday is promoted to the rank of Flg. Off. (Mar. 1). The following Plt. Offs. on probation are confirmed in rank:—R. P. S. Taylor (April 27); J. P. Rae (April 28). Flg. Off. F. T. Courtney relinquishes his comn. on completion of service (April 20).

Medical Branch.—F. G. Mogg, M.R.C.S., L.R.C.P., is granted a comn. in Class DD as a Flg. Off. (May 1).

Auxiliary Air Force.—General Duties Branch.—No. 602 City of Glasgow (Bombing) Sqdn.—The following to be Plt. Off.:—A. D. McNab (April 12).

Appointments.

Week ending May 7.

General Duties Branch.—Wing Commander R. B. Maycock, O.B.E., to R.A.F. Depot, Uxbridge, 26/4.

Flight Lieutenants G. M. F. O'Brien, D.S.C., to No. 207 Sqdn., Eastchurch, 8/5. C. H. Harrison, to R.A.F. Station, North Weald, 7/5. G. L. Carter, to No. 25 Sqdn., Hawkinge, 5/5. W. L. Payne, to No. 39 Sqdn., Bircham Newton, 7/5. W. G. L. Montagu-Douglas-Scott, to R.A.F. Depot, Uxbridge, on appointment to a S.S. Comn., 1/5. J. G. Western, M.B.E., to No. 1 Wing H.Q., India, 2/4. S. J. Smetham, to No. 60 Sqdn., India, 1/4. F. G. Stammers, O.B.E., to R.A.F. Depot, Uxbridge, 22/3. A. D. Rogers, A.F.C., to R.A.F. Depot, Uxbridge, 12/4. G. Archer, to No. 3 F.T.S., Grantham, 17/4. H. J. Gemmel, to R.A.F. Station, Sutton's Farm, 1/4. J. C. Stevens, to H.Q., A.D.G.B., 1/5.

Flying Officers J. R. Pocock, to R.A.F. Depot, Uxbridge, 30/4. H. A. Howes, to No. 1 F.T.S., Netheravon, 24/4. F. J. Knowler, to No. 3 Stores Depot, Milton, 23/5. R. H. Holmes, to No. 20 Sqdn., India, 4/4. S. H. C. Gray, to Aircraft Depot, India, instead of to No. 20 Sqdn. as previously notified, 28/2. E. F. Wain, to Aircraft Depot, India, instead of to No. 5 Sqdn. as previously notified, 28/2. K. C. Netherton, to Aircraft Depot, India, instead of to No. 31 Sqdn. as previously notified, 28/2. A. F. Adams, D.F.C., to R.A.F. Depot, Uxbridge, 15/4. J. W. New, to R.A.F. Depot, Uxbridge, 12/4. M. A. Platts, to R.A.F. Depot, Middle East, 10/4. W. Anderson, to No. 2 F.T.S., Digby, 4/5. (Hon. Flt. Lt.) F. P. Smythies, to R.A.F. Base, Gosport, 14/5. J. S. Phillips, to No. 10 Sqdn., Upper Heyford, 28/4. G. V. T. Thomson, to R.A.F. Base, Gosport, 27/4.

Pilot Officers E. C. T. Edwards, to No. 3 F.T.S., Grantham, on appointment to a Perm. Comn., 30/4. G. H. G. S. Jenkins, to Aircraft Depot, India, 28/4.

Medical Branch.—Flight Lieutenants B. F. Haythornthwaite, M.B B.A., to R.A.F. Depot, Uxbridge, 6/5. L. C. Palmer-Jones, M.B., t Station H.Q., Heliopolis, 1/4. C. J. S. O'Malley, to No. 208 Sqdn Middle East, 9/4. B. L. Edwards, M.B., to R.A.F. General Hospita 'Iraq, 13/4. L. I. Hyder, to R.A.F. Combined Hospital, 'Iraq, 12/4.

Stores Branch.—Wing Commander R. W. Thomas, O.B.E., to No. Stores Depot, Milton, to Command, 23/4.

Flying Officers L. T. Sanderson, D.S.M., and G. C. Wilson, t R.A.F. Depot, Uxbridge, 12/4. E. C. Farman, to No. 111 Sqdn Sutton's Farm, 1/4. H. O. Fellowes, to Aircraft Depot, 'Iraq, 15/4.

Accountant Branch.—Flight Lieutenant J. S. Griffiths, to Statio H.Q., Hinaidi, 6/4.

The 1928 Cairo—Cape Town Flight.

The four machines of the South African Air Force whic accompanied the R.A.F. Flight under Air Vice-Marshal T. Webb-Bowen, C.B., C.M.G., on their return journey fro Pretoria to Khartum, left Khartum on May 1. Two of the reached Pretoria at 17.30 hours on May 4. The third an fourth machines were held up at Korongea in Nyasaland b an accident to one of them.

The R.A.F. Display, 1928.

The first meeting of the Executive Committee of the R.A. Display, 1928, was held on May 3.

The constitution of the Committee is as follows:—Chai man, Air Marshal Sir John Salmond; Deputy Chairman, Ai Vice-Marshal F. R. Scarlett; Vice-Chairmen, Air Vic Marshal Sir John Steel and Air Commodore F. V. Holt Officer in charge of General Management, Wing Cdr. J. S. Bradley; Display Commandant, Wing Cdr. D. S. K. Crosbie Medical arrangements, Wing Cdr. H. Cooper; Servic Administration, Grp. Capt. R. C. M. Pink; Finance, Sq. Ld E. W. Gregory; Traffic Controller, Sq. Ldr. A. R. C. Cooper Signal arrangements and information bureaux, Sq. Ldr. F. Linnell; Liaison with the Provincial Flying Meetings, Sq. Ld J. H. d'Albiac; Stores, Flg. Off. A. J. Adams; Works Se vices, etc., Lt.-Col. W. W. Farthing; Press Publicity, C. Robertson, Esq.; Secretary, Lt.-Col. A. D. M. Brown.

A Flying sub-committee was formed under the chairma ship of Air Vice-Marshal Sir Robert Brooke-Popham and i cludes Wing Cdr. J. S. T. Bradley, Wing Cdr. E. H. Sparlin Flt. Lt. C. R. Carr, Flt. Lt. H. T. Lydford, and Flt. L J. C. Stevens.

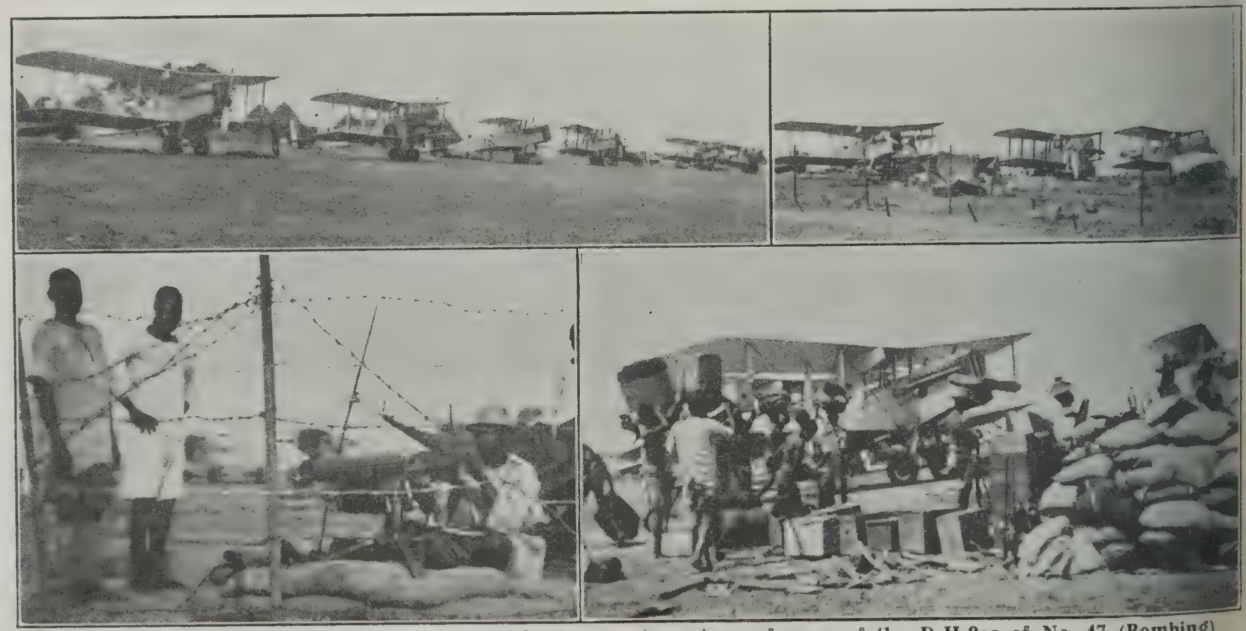
The R.A.F. Display will be held at Hendon on June 30.

Aircraft Carrier Movements.

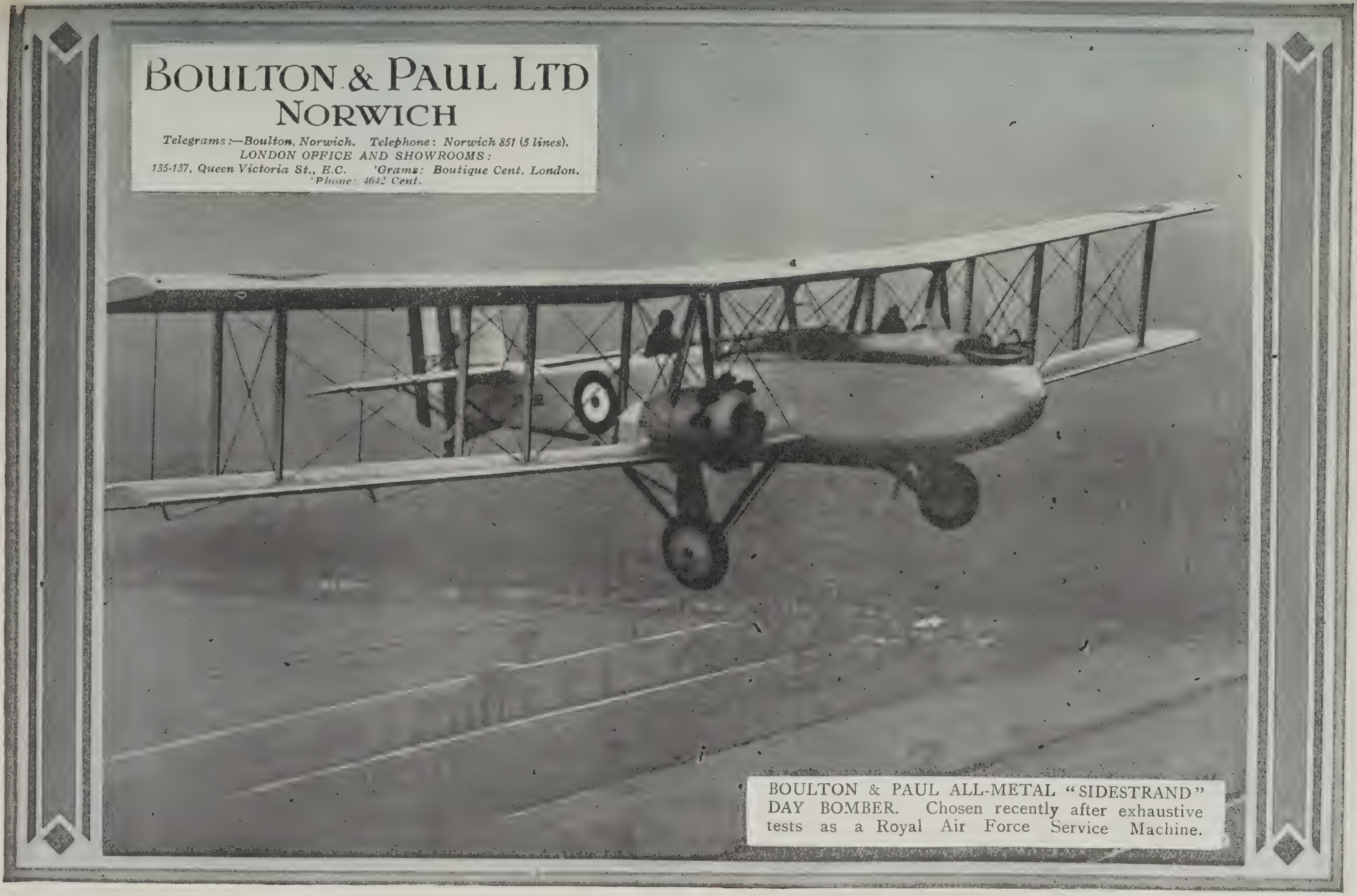
H.M.S. *Argus*, the R.A.F. Unit in which is under the con mand of Wing Cdr. C. E. Maude, has returned to Portsmout from China and will undergo a refit before joining the Atlant Fleet in June.

H.M.S. *Hermes*, the R.A.F. Unit in which is under the con mand of Wing Cdr. H. J. F. Hunter, M.C., has left Hon Kong, where she has been undergoing repairs, for Chefoo, commercial port in the Chihli Strait, within 200 miles of th entrance to the Yellow River upon which is situated Tsinanf the scene of the recent massacre of Japanese civilians.

H.M.S. *Vindictive*, whose Senior R.A.F. officer is Sq. Ld



R.A.F. OPERATIONS IN THE SUDAN.—At the top are two views of some of the D.H.9as of No. 47 (Bombing) Squadron taken during the recent operations in the Sudan. The two lower pictures show two corners of the zareba, which was protected by a Sudanese machine-gun battery. All four photographs were taken in the neighbourhood of Lake Gow.



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BOULTON & PAUL ALL-METAL "SIDESTRAND" DAY BOMBER. Chosen recently after exhaustive tests as a Royal Air Force Service Machine.

"Aeroplane" photograph

E. J. P. Burling, D.S.C., D.F.C., returned to Portsmouth from the China Station and proceeded to Chatham on May 3 for refit as flagship of the Rear-Admiral Commanding, Second Cruiser Squadron

H.M.S. *Eagle,* the R.A.F. Unit in which is under the command of Wing Cdr. R. M. Field, was one of the first vessels to arrive at Corinth to assist in the rescue work among the victims of the recent earthquake disaster in Corinth. H.M.S. *Eagle* was at Naples when the news of the disaster arrived and she was ordered by wireless to return to Malta for stores and equipment and proceed to Corinth.

Transfers to the Reserve.

Air Ministry Orders state that the undermentioned officers, serving on short service commissions, are due to transfer to the reserve on the dates indicated, on the completion of their service on the active list of the R.A.F. :—

Flight Lieutenants.—(July 1, 1928), D. E. Ward; (Sept. 12), R. E. H. Allen, D. W. Clappen, T. L. Pynches; (Sept. 28), R. J. K. Chattey.

Flying Officers.—(July 3), A. I. Riley, A.F.C.; (July 9), J. S. Dick; (July 14), H. L. R. Gough, A. G. Moon, J. W. New, C. R. Troup, T. R. Wheatley; (July 16), P. R. Stroud; (July 24), H. C. F. Ellis; (Aug. 4), J. R. Brown, D.F.C.; (Aug. 15), F. H. Woolliams; (Aug. 22), C. H. A. Farnan, S. J. Stocks; (Aug. 29), B. J. J. Nimmo; (Sept. 10), A. K. Bamber; (Sept. 12), S. G. Newport; (Sept. 15), C. G. M. Anderson, C. H. W. Boldero, D. C. Burnley, K. Maconochie, D. J. F. McMillan, C. N. A. B. Mumby, L. H. Ross, S. M. Thomas; (Sept. 16), W. W. Whitehead; (Sept. 18), W. N. L. Cope, C. B. Wilson.

The Royal Tournament.

The Royal Tournament will open at Olympia on May 24 and will run until June 9. The programme will include a display of Physical Training Drill by recruits from the R.A.F. Depot, Uxbridge.

The Central Band of the R.AF.

The Central Band of the R.A.F. will leave on June 21 for a three months' tour of Canada and the United States under Flt. Lt. J. H. Amers, M.B.E. The Band will play in Quebec, Calgary, Vancouver, Seattle, Winnipeg, Montreal and Toronto and will return to England on Sept. 19.

This will be the first time that the R.A.F. Central Band has left this country.

Wing Commander A. J. Miley.

Wing Cdr. A. J. Miley, O.B.E., whose appointment to H.Q. Coastal area, for Air Staff Duties, is dated May 1, 1928, was born in 1890 at Hampstead and educated at Eastman's Academy, Winchester, and the R.N. College, Dartmouth. He entered the Royal Navy in 1904 and was promoted to be Lieutenant, R.N., in 1911. He learned to fly on a Bristol biplane on Salisbury Plain and his Royal Aero Club certificate No. 534 is dated July 1, 1913. He was appointed Flight Lieutenant, R.N.A.S. early in 1914 and Flight Commander at the end of 1914 and Squadron Commander in 1916. After the Armistice he was appointed to the Department of Supply and Research at the Air Ministry and in 1922 he was posted to the Aircraft Depot, Egypt. In February, 1923, he was appointed to command the R.A.F. Unit in H.M.S. *Ark Royal,* and in August, 1923, he was appointed to command the R.A.F. Base at Malta. He was promoted to the rank of Wing Commander in January, 1924, and posted to command the R.A.F. Unit in H.M.S. *Argus,* in March, 1924. In January, 1926, he was seconded for two years for duty with the Chilean Navy.

Squadron Leader C. H. Elliott-Smith.

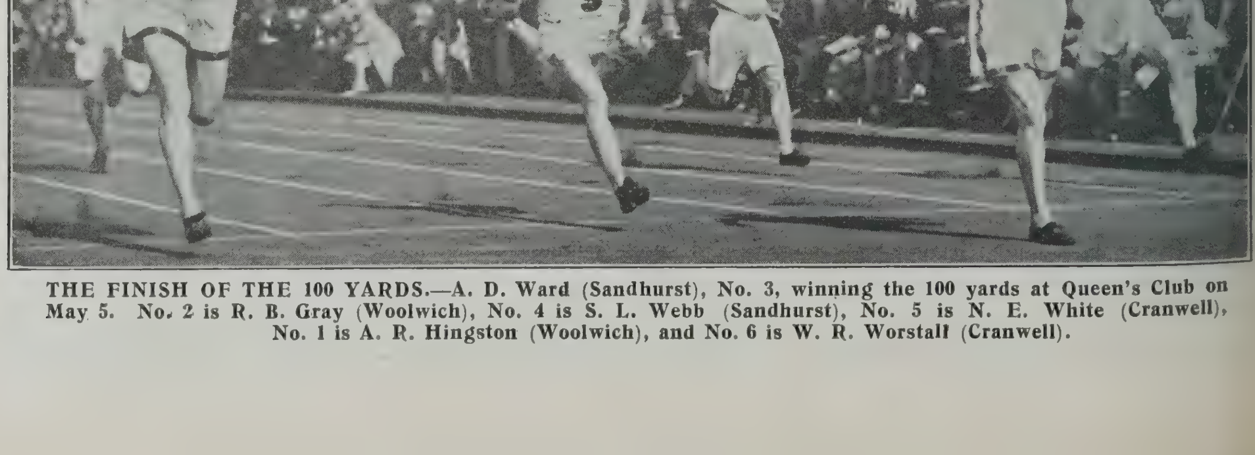
Sq. Ldr. C. H. Elliott-Smith, A.F.C., whose appointment to command the newly-formed No. 504 (Bombing) Squadron at Hucknall is dated April 23, 1928, was born in 1889 at Bedford and educated at Bedford School. After serving in the 19th (Public Schools) Battn. Royal Fusiliers he was granted a commission in the 9th Battn. the Bedfordshire Regiment in December, 1914, and seconded to the R.F.C. in November, 1915. He served in Egypt from November, 1915 until July, 1916, and in Mesopotamia from September, 1916, until September, 1917, and in Egypt again from September, 1917, until August, 1919. He was awarded the Air Force Cross in October, 1919. In 1920 he was posted to H.Q. Palestine Group, R.A.F. In January, 1922, he was promoted to the rank of Squadron Leader and posted to H.Q. Inland Area for Air Staff (Training) Duties. In 1923 he successfully completed a course at the R.A.F. Staff College, Andover, and in 1924, after a course of instruction at No. 24 (Communication) Squadron, he was posted to the Armament and Gunnery School at Eastchurch. In August, 1926, he was appointed to command No. 56 (Fighter) Squadron and in January, 1928, he was posted to Sheerness for the Army Senior Officers' Course.

Squadron Leader E. O. Grenfell.

Sq. Ldr. E. O. Grenfell, M.C., D.F.C., A.F.C., whose appointment to command No. 1 (Fighter) Squadron is dated Mar. 19, 1928, was born in 1890 at Prittlewell, Rochford, Essex, and educated at Lee-on-Solent and Bradfield College. He joined the 28th County of London Regiment (Artists' Rifles) in 1909. In 1912 he joined the Surma Valley Light Horse and served with that Regiment in India for three months. In 1913 he was appointed to a commission in the 5th Battn. D.C.L.I., and was promomted to be Lieutenant in March, 1914. He learned to fly on a Maurice Farman biplane at Upavon and his Royal Aero Club Certificate No. 966 is dated Nov. 9, 1914. In August, 1915, he was transferred to the R.G.A. and seconded to the R.F.C. In March, 1916, he was awarded the Military Cross for attacking single-handed and destroying three enemy Fokkers. From April to July, 1916, he was an Instructor at the Central Flying School and in 1917 he was appointed to command No. 23 Squadron in the Field. In November, 1918, he was awarded the Air Force Cross for valuable flying services. In August, 1919, he was appointed to a permanent commission in the R.A.F. with the rank of Flight Lieutenant. In 1921 he was posted to No. 27 Squadron, India, and was awarded the Distinguished Flying Cross for distinguished services in the Waziristan operations between January, 1922, and April, 1923. He was promoted to the rank of Squadron Leader in June, 1923, and posted to command No. 1 (Fighter) Squadron in 'Iraq. In 1924 he was restored to the Home Establishment and posted to No. 7 (Bombing) Squadron.

A New Director of Works and Buildings.

The Air Ministry announces that the Secretary of State for Air has appointed Colonel Commandant H. Biddulph,



THE FINISH OF THE 100 YARDS.—A. D. Ward (Sandhurst), No. 3, winning the 100 yards at Queen's Club on May 5. No. 2 is R. B. Gray (Woolwich), No. 4 is S. L. Webb (Sandhurst), No. 5 is N. E. White (Cranwell), No. 1 is A. R. Hingston (Woolwich), and No. 6 is W. R. Worstall (Cranwell).

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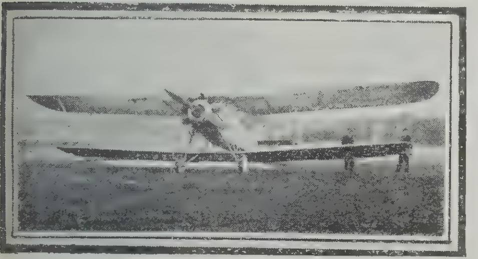

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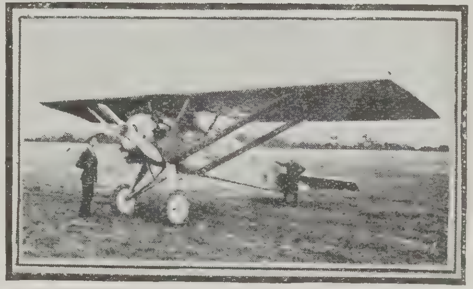

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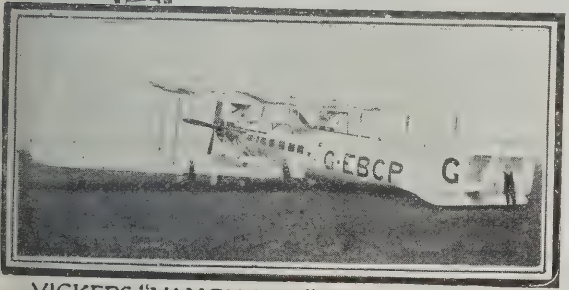

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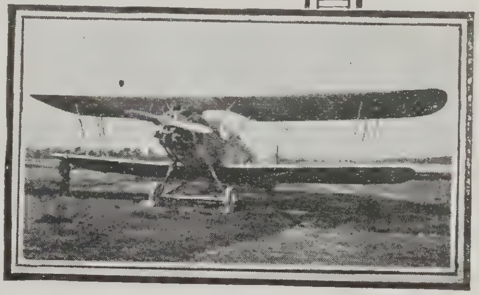

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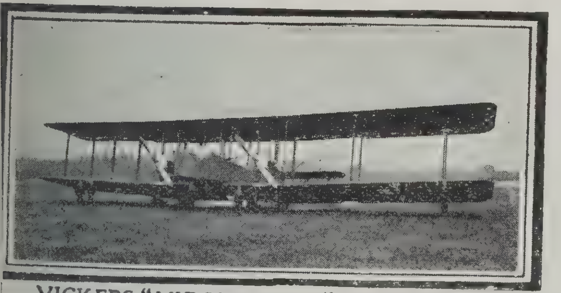

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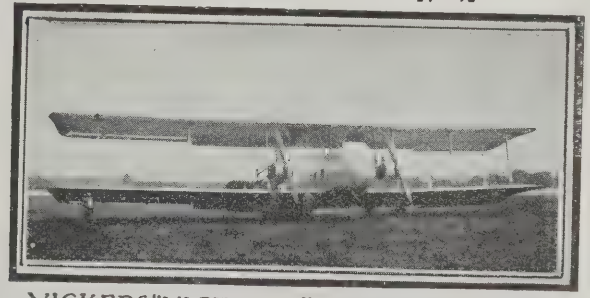

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C.B., C.M.G., D.S.O., to be Director of Works and Buildings, Air Ministry, as from July 7 next, in succession to Major-General Sir William A. Liddell, K.C.M.G., C.B., who is retiring from the public service.

Colonel Commandant Biddulph was born in 1872, the third son of the late General Sir Robert Biddulph, G.C.B., G.C.M.G. He served with the Royal Engineers in the Tirah Expedition of 1897, in the Waziristan Expedition of 1902, and in the European War, 1914-1919. After the Armistice he was appointed Chief Engineer to the Northern Command, in 1927 he became Chief Engineer to the Southern Command.

R.A.F. SPORTS AND PASTIMES.

Service Cadets' Athletics.

The annual triangular athletic match between the Cadets of the Royal Military Academy, Woolwich, the Royal Military College, Sandhurst, and the R.A.F. Cadet College, Cranwell, was held at Queen's Club on May 5. Sandhurst won with 31 points, Cranwell was second with 16 points, and Woolwich third with 7 points. (Last year Sandhurst scored 33, Cranwell 13, and Woolwich 8.)

The referee was Air Vice-Marshal Sir Philip Game, K.C.B., D.S.O.

Cranwell won Putting the Weight, Flt. Cdt. R. W. Letchworth, 34 ft. 6 in.; the Long Jump, Flt. Cdt. N. E. White, 21 ft. 9¾ in., a record for these meetings; and the One Mile, Flt. Cdt. Weait, 4 min. 40 4-5 sec. Flt. Cdt. H. R. Dale ran second in the Two Miles. He was handsomely beaten by Cdt. D. Meynell, of Sandhurst, whose tremendous sprint in the last lap caused despair to all Cranwell supporters except one Flight Serjeant, who was heard murmuring, "Perhaps he'll drop dead!"

Four of the sixteen Cranwell competitors were formerly Aircraft Apprentices from Halton or Cranwell.

The results in detail were :—

High Jump.—C. York (R.M.C.), 5 ft. 9 in., 1; E. Calderbank (R.M.C.), 5 ft. 6 in., 2; J. G. W. Western (R.A.F.), 5 ft. 5 in., 3.

100 *Yards.*—A. D. Ward (R.M.C.), 1; S. L. R. Webb (R.M.C.), 2; N. E. White (R.A.F.), 3. Won by a yard. Time, 10 3-10 sec.

Half-mile.—G. L. Rampling (R.M.A.), 1; C. R. M. Threlfall (R.M.C.), 2; K. W. Niblett (R.A.F.), 3. Won by six yards. Time, 2 min. 2 1-5 sec.

Putting the Weight.—R. W. Letchworth (R.A.F.), 34 ft. 6 in., 1; G. P. Charles (R.A.F.), 34 ft. 5 in., 2; J. W. Wainwright (R.A.F.), 33 ft. 9 in., 3.

Long Jump.—N. E. White (R.A.F.), 21 ft. 9¾ in., 1; S. L. B. Webb (R.M.C.), 20 ft. 7¼ in., 2; Muhammed Yousaf (R.M.C.), 19 ft. 9 in., 3

Two Miles.—D. Meynell (R.M.C.), 10 min. 14 2-5 sec., 1; H. R. Dale (R.A.F.), 10 min. 28 2-5 sec., 2; H. G. C. Merritt (R.M.C.), 10 min. 29 3-5 sec., 3.

Quarter-mile.—R. H. Batten (R.M.C.), 1; G. A. Tod (R.M.C.), 2; J. W. Wainwright (R.M.A.), 3. Won by 2½ yards. Time, 53 2-5 sec.

One Mile.—A. L. Weait (R.A.F.), 1; T. T. Body (R.M.C.), 2; D. W. Price (R.M.A.), 3. Won by 20 yards. Time, 4 min. 40 4-5 sec.

120 *Yards Hurdles.*—Preliminary Heat (second strings): T. Kinnersley (R.M.C.), won in 17 1-10 sec. Final: Kinnersley, 1; E. H. Cadogan (R.M.C.), 2; M. A. W. Rowlandson (R.M.A.), 3. Won by inches. Time, 16½ sec.

The Central Band of the R.A.F. played during the afternoon.—C. M. McA.

The Imperial Services Boxing Championships.

The Imperial Services Boxing Championships took place at Portsmouth on April 26 and 27. The results of the semi-finals and finals were :—

Bantam-weights.—Semi-final: Stoker Cockerall (R.N.) beat L-AC. Williamson; Sjt. Fleming (Army) beat Petty Officer Tatton (R.N.). Final Round: Cockerall beat Sjt. Fleming.

Feather-weights.—Semi-final: AC. Scroggins (R.A.F.) beat Driver Morpeth (Army); Company S-M. Hoban (Army) beat AC. Older (R.A.F.). Final Round: Hoban beat Scroggins.

PUTTING UP A RECORD.—Flt. Cdt. N. E. White (Cranwell) jumping 21 ft. 9¾ in. on May 5 at Queen's Club, a long jump record for the matches between the Cadets of Woolwich, Sandhurst and Cranwell.

Fly-weights.—Final Round: Ldg Stoker Tull (R.N.) beat AC. Winslade (R.A.F.).

Light-weights.—Final Round: Able Seaman Watson (R.N.) beat Able Seaman Pledger.

Welter-weights.—Final Round: Cpl. Duncan (R.M.) beat L-AC. McCann (R.A.F.).

Middle-weights.—Final Round: Able Seaman Ewin (R.N.) beat Bombardier Stephens (Army).

Heavy-weights.—Final Round: Stoker Mann (R.N.) beat Ordinary Seaman Judge (R.N.).

Light-heavy-weights.—Final Round: Able Seaman Rowles (R.N.) beat AC. Rollason (R.A.F.) in the third round.

This Tournament was open to all Service boxers, professional, Service amateur and amateur.

The R.A.F. Dinner Club.

The sixth annual dinner of the R.A.F. Dinner Club will be held in the Connaught Rooms at 20.00 hours on June 29, the eve of the R.A.F. Display.

Membership of the club is open to past and serving

ON THE MARK.—Competitors ready for the start of the Two Miles race at Queen's Club on May 5. The R.A.F. Band are in the background.—(*"Aeroplane" photograph.*)

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officers of the R.A.F. (including the R.N.A.S. and the R.F.C.). Forms of application for membership may be obtained from the Hon. Secretary, R.A.F. Dinner Club, No. 3 F.T.S., R.A.F., Grantham, Lincs.

Facilities are being extended whereby units can take advantage of this annual dinner to hold a reunion of past and serving officers. Members will be asked to state on the application for a dinner ticket the unit with which they wish to sit, if desirous of taking advantage of these facilities. On receipt of this information the necessary seats will be reserved by the Committee.

The cost of membership is 5s. annually or £3 3s. for Life Membership; the cost of a ticket for the dinner is 10s.

"Time Flies" at Halton.

A very interesting entertainment was given in April at Halton Camp. The Halton Debating Society, which has hitherto presented several straight plays, surpassed itself by producing an original musical comedy, "Time Flies." The entire cast was composed of Halton aircraft apprentices, and all the scenery and "noises off" were made by them. The play was written and stage-managed entirely by members of the Educational staff, and the music was composed by a local musician. The orchestra and dance band, conducted by the composer, played admirably.

The first scene shows a dormitory in camp just before lights out, and one of the three heroes is explaining his new invention—a Time-Machine, after the style of that described by Mr. H. G. Wells in his well-known novel. Act II begins with the three intrepid adventurers travelling back through time. When 1588 is reached the machine stops, and the adventurers have an exciting time in the old-world village of Wendover, where, being unable to explain their presence, they only just escape being pressed into her Majesty's Army. The machine plunges into time again, and an amazingly varied series of events are witnessed and described before it again stops, this time at Stonehenge in 1928 B.C. The adventurers arrive in time to supply the need of a human for sacrifice, and one of their number, being captured, is only rescued in a melodramatic entry of the other two with revolvers.

The time-machine, on being reversed, seems a little unruly, for it refuses to stop at 1928 A.D. and goes right on for another 100 years, plunging the trio into the home life of one of their own descendants. This awkward predicament is somewhat lost to sight under the marvels of wireless telephony and television. Among the scenes witnessed is the 1928 boat-race (taken by a special representative sent for the purpose and shown by the standard Kodascope Projector). Even in the future life is full of trouble, and the heroes hastily seek their machine, preferring the camp life of 1928 A.D. to any other period they have sampled.

The plot is ambitious, but nothing seems too much for the R.A.F. The Debating Society is to be most heartily congratulated on its wonderful achievement, which gave three hours' continuous enjoyment both to their own fellows, the visitors, and—"An Outsider."

AIR AFFAIRS IN PARLIAMENT.

FLEET AIR ARM PRIZES.

In the House of Commons on Mar. 29, Mr. Hore-Belisha asked the First Lord of the Admiralty the nature of the prizes to be awarded annually to the naval observer for the best essay on some specified subject dealing with the work and development of the Fleet Air Arm, and to the officer who passes the best final examinations in the qualifying course for the best officers? Lt.-Col. Headlam said that the prize for naval observers would consist of a silver medal, together with a sum of money (depending upon the balance of income available) for the purchase of books and instruments. The prize for signal specialists would consist of a sum of money (the income available) for the purchase of books and instruments.

IMPERIAL AIRWAYS LIMITED.

In the House of Commons on Apr. 5, Cdr. Bellairs asked the Chancellor of the Exchequer whether, seeing that an extensive mileage is flown in America without subsidy, and in view of the increased profits during the last financial year of Imperial Airways at the rate of £10,000 per month, any steps are to be taken towards altering the subsidy system?

Sir S. Hoare: I have been asked to reply. My hon. and gallant Friend is apparently misinformed. The net profit disclosed by the profit and loss account of the last published balance-sheet of Imperial Airways Limited was £11,461 for the year (after the subsidies had been credited) and not £10,000 per month. This profit shows an improvement on the results of previous years, when losses of larger amounts were recorded, but it is clear that at present the company cannot continue to operate without financial assistance. I would remind my hon. and gallant Friend that aircraft-operating companies in America receive financial assistance by means of postal contracts and considerable additional assistance in the shape of the provision of free ground organisation. The conditions prevailing in America are entirely different from those prevailing in the Eastern Hemisphere.

FATAL ACCIDENTS IN THE R.A.F.

In the House of Commons on April 25, in reply to a question by Mr. Robinson, the Secretary of State for Air gave the following figures of the fatal accidents in the R.A.F. and the numbers of lives lost from the beginning of 1919. (The first figure after each year refers to the number of fatal accidents and the second figure is the number of deaths): 1919, 138, 180; 1920, 22, 37; 1921, 22, 37; 1922, 32, 51; 1923, 31, 46; 1924, 48, 71; 1925, 41, 58; 1926, 53, 85; 1927, 48, 55; 1928 (to April 24), 15, 24.

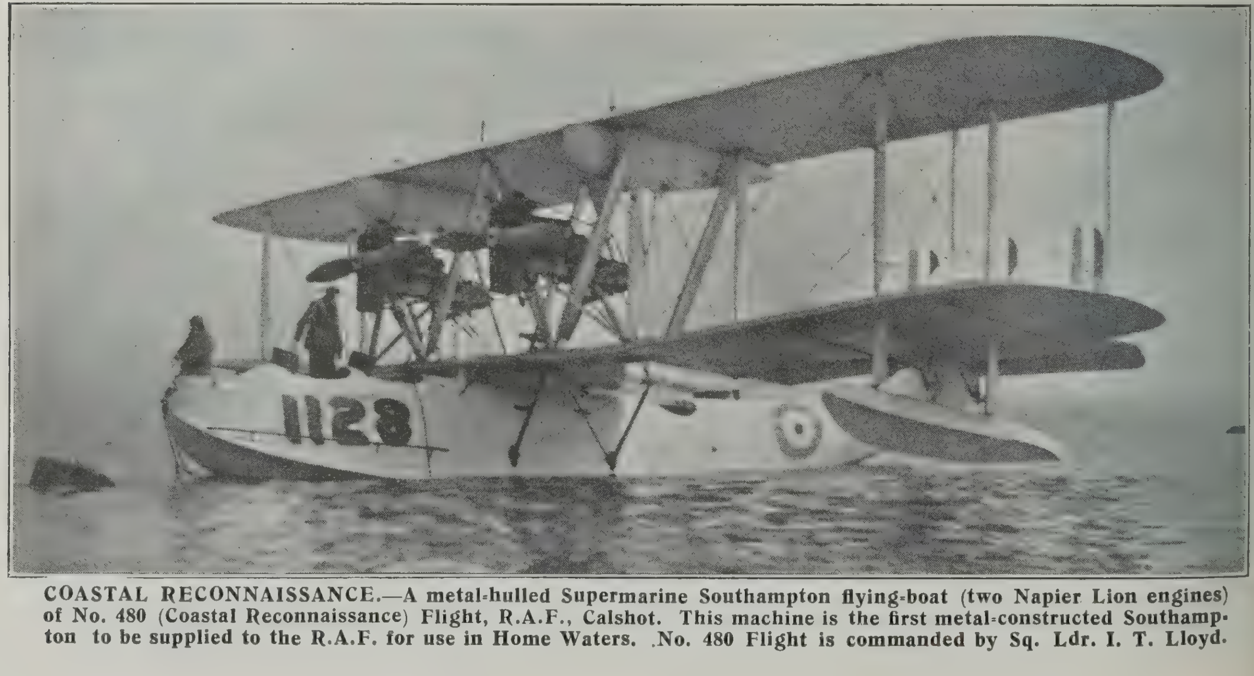
In reply to the second part of Mr. Robinson's question, Sir Samuel Hoare said that it was expected that at least nine types of all-metal machines would be in service before the end of 1928 and that the whole Air Force would be so equipped within five years. The all-metal machine was not, however, being introduced as a safety measure, but to facilitate the standardisation of aircraft and simplify their production, maintenance and repair.

HIGH SPEED FUEL.

In the House of Commons on May 2, in reply to a question by Mr. Day, the Under-Secretary of State for Air said that ethyl petrol was used by high-speed aircraft during practice flights undertaken by officers in the Air Service. In reply to a supplementary question, Sir Philip Sassoon said that experiments had been made during the past four years with this special spirit and there was no evidence to show that it was more dangerous than the ordinary spirit.

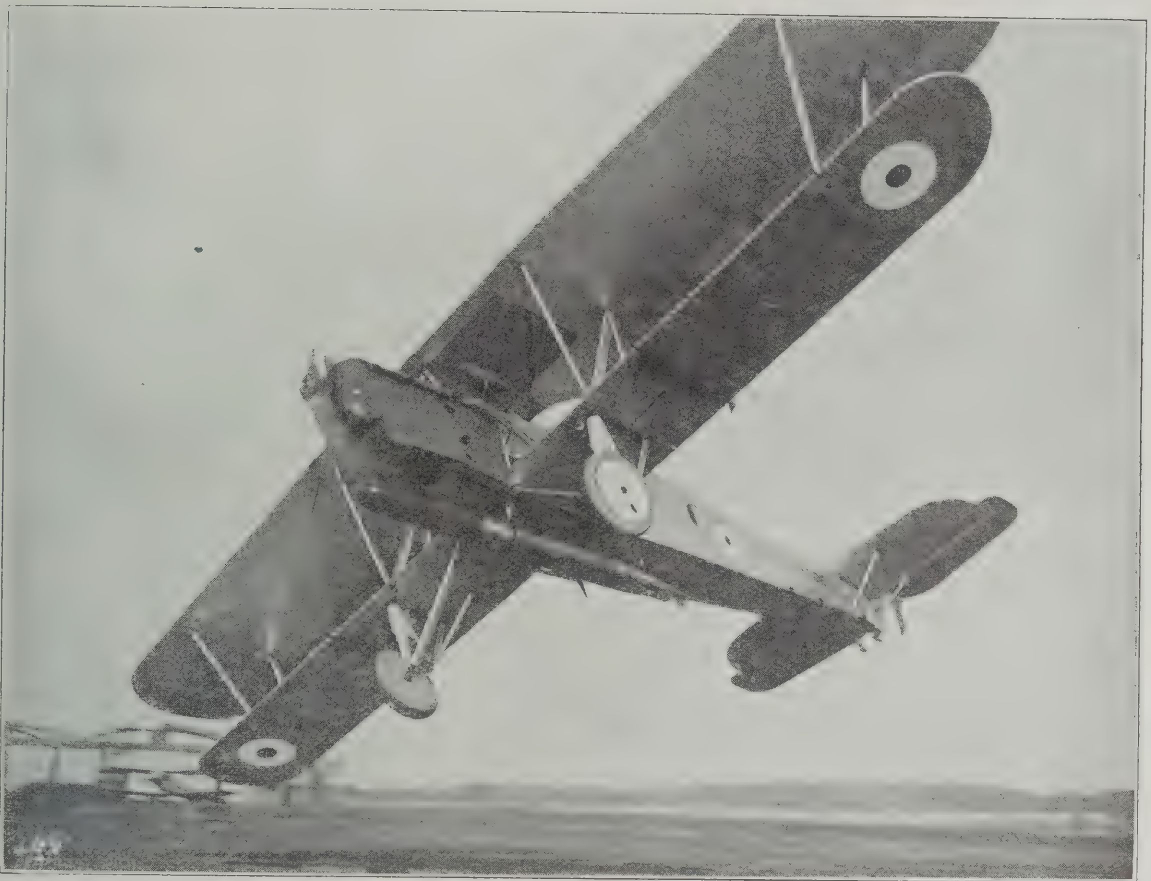
THE LONDON—INDIA SERVICE.

In the House of Commons on May 2, in reply to a question by Mr. Malone, the Under-Secretary of State for Air made the following statement:—The sum provided in the current Air Estimates in respect of subsidies on the Cairo—Karachi route is £93,600. As I intimated in the memorandum accompanying the Air Estimates and in my statement in the House on Mar. 12, it has been decided to substitute a new and comprehensive agreement with Imperial Airways for the agreements at present in force and relating to the European and Eastern services respectively. The new agreement will provide for the operation of a weekly air-mail service between England and India beginning on or about April 1, 1929, and I am hopeful that it will be possible to adhere to this date. A White Paper will be laid before the House in due course.



COASTAL RECONNAISSANCE.—A metal-hulled Supermarine Southampton flying-boat (two Napier Lion engines) of No. 480 (Coastal Reconnaissance) Flight, R.A.F., Calshot. This machine is the first metal-constructed Southampton to be supplied to the R.A.F. for use in Home Waters. No. 480 Flight is commanded by Sq. Ldr. I. T. Lloyd.

COASTAL DEFENCE



"Flight" Photo.

"The Hawker 'Horsley' Torpedo Bomber as illustrated is now in production. The machine meets in every respect the exacting requirements of torpedo carrying aircraft and can be considerably overloaded without impairing its efficiency."

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ANOTHER DEMONSTRATION OF SLOTTED SAFETY.

On May 7 a demonstration was given by Handley Page Ltd. of the De Havilland Moth fitted with automatic slots which is to be used by Sq. Ldr. T. H. England on a demonstration tour, the object of which will be to exhibit the virtues of the slot over practically the whole of Europe.

The particular machine for this tour is fitted with one of the new Moth divided-axle undercarriages, similar to that used by Capt. de Havilland in his demonstration of the safety of the slotted Moth, in order that the safety of stalled landings may be shown as fully as possible.

Unfortunately—apparently as the result of a defective fitting—this undercarriage failed on the second landing on this particular occasion, and some damage was done to the fuselage, which will delay the start of Sq. Ldr. England's tour for a day or two.

It should however be said that at the meeting at Bristol on the previous week-end, this machine had been flown into or dropped onto the ground in a most merciless fashion, and that on the day of the demonstration the two landings made were such that any normal unslotted aeroplane would have been completely wrecked by either.

As soon as the accident occurred, the De Havilland Aircraft Co. were informed, and they at once sent over a second slotted Moth in order that those assembled might be taken into the air to see for themselves how this type of machine behaves in the air. The second machine had a normal undercarriage, so that only normal landings could be attempted.

The air at the time was quite distinctly bumpy, and arguing from the characteristic of normal aeroplanes at low flying speeds, it was expected that flying in the stalled condition the bumpiness would lead to wallowing on the part of the machine. Actually stalled flying on this machine was very much more peaceful, and very much steadier than flying at normal speeds. The bumps, which were quite noticeable in the ordinary way, seemed to disappear as soon as the tail got well down and there was no unpleasant sense of an unduly rapid descent—until it was noticed that the earth was approaching with unseemly rapidity.

There can be no question of the effectiveness of both aileron and rudder on this type of machine when stalled. No unusually coarse movements of either were used, either for correcting disturbances or for turning in stalled flight.

Recovery of normal flight after a stall, produced by pulling the controls right back steadily and gently, takes place without anything approaching a dive when the stick is returned to its normal position. If the machine is stalled by a more abrupt movement backwards of the control, recovery entails a moderately steep, but surprisingly short dive. It is true that full engine was used on the particular flight now considered, and that with engine off more room would be required for such a recovery.

The most marked feature of the recovery from stalled flight with the slotted Moth is the complete absence of any disconcerting abruptness about the affair. The nose goes quietly down when, and not before, the pilot eases the stick forward.

Seen from the ground previous demonstrations of various slotted-winged machines have given full proof that such machines could be kept under control when stalled, but it is difficult to realise how complete and effective that control is, and how utterly different from the normal is the behaviour of a slotted machine until that difference has been felt in the air

AN AERONAUTICAL AMALGAMATION.

A very circumstantial and wide-spread rumour has been current in the past week that Mr. J. D. Siddeley has purchased from Crossley Motors Ltd. the whole of that firm's interest in A. V. Roe and Co. Ltd.

There is very strong reason to believe that this rumour is well founded, but so far it has been impossible to obtain official confirmation of this transaction from either of the parties directly concerned in it.

NO AIR-FLIVVERS YET.

During the past week it was announced in the daily Press that Mr. Handley Page, who is now in the United States, was negotiating with the Ford Motor Company for the mass production, both in this country and the United States, of light aeroplanes to be fitted with the Handley Page automatic slot.

Mr. Handley Page has since declared that he has not "the remotest idea" of concluding an agreement with Mr. Ford for the production of such an aircraft.

SIR ALAN COBHAM'S PROGRESS.

On April 17 Sir Alan Cobham and party left Abijean, the port of Bingerville, on the Ivory Coast, to fly to Freetown, Sierra Leone, but he was forced to alight in Fresco Bay, Ivory Coast, owing to a leaking radiator.

The machine was moored out in a lagoon, and Sir Alan proceeded by canoe to Lahou, where he got in touch with the French authorities and made arrangements for the obtaining of the necessary spare parts.

As it was necessary to obtain spares from England, he has been compelled to remain at Fresco for some considerable time.

SYDNEY—SINGAPORE.

On May 7 Wing-Cdr. L. J. Wackett, D.F.C., A.F.C., R.A.A.F., arrived at Port Darwin from Sydney on the Wackett Widgeon amphibian flying-boat (Siddeley Jaguar engine) after having flown a distance of 2,570 miles in four days.

He is attempting to fly from Sydney to Singapore, and intended leaving Port Darwin on May 8 for Koepang, Timor, in the Dutch East Indies.

1,700 HOURS WITHOUT OVERHAUL.

The De Havilland Aircraft Co. Ltd. recently received a letter from Mr. Norman Brearley, managing director of West Australian Airways Ltd., of Perth, Western Australia, stating that the latter firm have recently, for the first time, completely overhauled the first of the D.H.50 aeroplanes supplied to them after 1,700 hours' flying.

On stripping this machine it was found that practically no work other than cleaning was required to bring the machine back to perfect structural condition. The most important renewal needed was the re-upholstery of the cabin furnishings. All plywood was in excellent condition, in spite of the fact that this machine has been at work in a tropical climate, and throughout its life the machine has given no trouble.

THE ITALIAN POLAR EXPEDITION.

On May 3 the airship "Italia," in which General Nobile is undertaking a Polar Exploration, left Seddin, near Stolp, and flew to Vadsö, in the extreme north of Norway, after a flight lasting 29 hours. Here the ship was secured to a mooring mast during which process it was slightly damaged.

On May 5 it left Vadsö at 20.00 hours and arrived at King's Bay, Spitzbergen, at 13.00 hours on the following day.

King's Bay will be used as a base for a number of exploration cruises over the arctic, one of which will be over the North Pole.

One of the first objectives of the expedition will be to survey Nicolasland to the north of Siberia, the extent and constitution of which is at present unknown. General Nobile hopes to make a landing at the North Pole and he will if possible anchor there for several days.

The "Italia" is fitted with wireless so that it can keep in touch with the outside world and the supply-ship *Citta di Milano*, at King's Bay, will be in constant touch with Rome.

The expedition is expected to last for two months.

THE ALL-AMERICAN AERO SHOW.

It is reported in *Air Transportation*, of New York, that as the result of the Aero Show held at Detroit from April 14 to April 21, 325 aircraft valued at $1,930,555 (£386,000 approx.) were sold by twenty-three exhibitors.

The biggest orders were: 100 Monocoupe monoplanes (Mono Aircraft Inc., Molini, Ill.) to a total value of $267,500 (£53,500); 61 Mohawk Pinto monoplanes (Mohawk Aircraft Corpn., Minneapolis, Minn.) to the value of $195,200 (£39,040); 19 Hamilton monoplanes (Hamilton Metalplane Company, Milwaukee, Wis.) to the value of $399,000 (£79,800); 30 Stinson aircraft (Stinson Aircraft Corpn., Detroit, Mich.) valued at $255,500 (£51,100); 10 Bellanca monoplanes (Bellanca Aircraft Corpn., Wilmington, Dela.) valued at $145,000 (£29,000).

THE U.S.S. LEXINGTON.

The U.S.S. *Lexington*, the latest aircraft-carrier built for the U.S. Navy and sister-ship to the U.S.S. *Saratoga*, has undergone her acceptance trials off the Pacific coast. It is understood that these were unsatisfactory and that the U.S. Navy have refused to accept her.

Rumour has it that the maximum speed she could make was 22 knots, 10 knots below her contract speed.

The *Lexington*, a converted battle-cruiser, has a normal displacement of 33,000 tons and has accommodation for 272 aircraft. The total cost of the ship is estimated at £9,000,000.

RUSSIA'S "REPLY TO CHAMBERLAIN."

The Riga correspondent of *The Times* reports that on the occasion of the Moscow May-day festival the "Our Reply to Chamberlain Fund," which was inaugurated after the Anglo-Soviet breach, handed over forty-nine more aeroplanes to the Red Army.

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THE ROYAL AERO CLUB.

On April 25, 1928, the Committee Meeting of the Royal Aero Club was held at 3, Clifford Street, W.1, at which the following were present: Lieut.-Col. M. O'Gorman, C.B. (in the Chair), Mr. Griffith Brewer, Capt. R. J. Goodman-Crouch, Brig.-General Sir Capel Holden, K.C.B., F.R.S., Mr. E. J. B. How, Lieut.-Col. Sir Francis K. McClean, A.F.C., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Major H. A. Petre, D.S.O., M.C., Capt. C. B. Wilson, M.C., and Mr. H. E. Perrin (Secretary).

Brig.-Gen. Lord Thomson, P.C., C.B.E., D.S.O., and Lieut.-Col. M. O'Gorman, C.B., were unanimously elected Chairman and Vice-Chairman respectively for the ensuing year.

The following Sub-Commiteees were appointed:—

Racing Committee.—Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Lieut.-Col. W. A. Bristow, Lieut.-Col. M. O. Darby, O.B.E., Colonel F. Lindsay Lloyd, C.M.G., C.B.E., Major R. H. Mayo, O.B.E., Capt. C. B. Wilson, M.C., and the following representing the General Council of Associated Clubs:—Mr. J. F. Leeming (Lancashire Aero Club), Mr. R. J. Parrott (Hampshire Aeroplane Club), Colonel The Master of Sempill (London Aeroplane Club).

Technical Committee.—Major T. M. Barlow, Major J. S. Buchanan, O.B.E., R. S. Capon, Sq. Ldr. T. H. England, D.S.C., W. O. Manning, Major R. H. Mayo, O.B.E., Lieut.-Col. M. O'Gorman, C.B., Lieut.-Col. H. W. S. Outram, C.B.E., Sq. Ldr. M. E. A. Wright, A.F.C.

Private Owners' Committee.—Capt. S. J. Burt, Capt. G. de Havilland, G. Merton, Major H. A. Petre, D.S.O., M.C., Miss W. E. Spooner, Flt. Lt. F. O. Soden.

House Committee.—Ernest C. Bucknall, Major H. J. Corin, F. P. Dickson, E. J. B. How, D. C. MacLachlan, J. Stewart Mallam, Major H. A. Petre, D.S.O., M.C., Major S. V. Sippe, D.S.O.

Finance Committee.—Griffith Brewer, Ernest C. Bucknall, Lieut.-Col. M. O. Darby, O.B.E., J. Stewart Mallam, F. Handley Page, C.B.E.

Schneider Trophy Race, 1929.—*Royal Aero Club*: Lieut.-Col. W. A. Bristow, Lieut.-Col. M. O. Darby, O.B.E., Lieut.-Col. M. O'Gorman, C.B., Capt. C. B. Wilson, M.C. *Air Ministry*: Major J. S. Buchanan, O.B.E., R. H. S. Mealing, Wing Cdr. S. W. Smith, O.B.E. *S.B.A.C.*: Cdr. James Bird, H. Burroughes, H. T. Vane.

Joint Standing Committee (R.Ae.C. and S.B.A.C.)—Air Vice-Marshal Sir W. S. Brancker, K.C.B., A.F.C., Lieut.-Col. M. O'Gorman, C.B., Lieut.-Col. Sir Francis K. McClean, A.F.C., Capt. C. B. Wilson, M.C.

Joint Standing Committee (R.Ae.C., R.Ae.S. and S.B.A.C.).—Lieut.-Col. M. O'Gorman, C.B., Major H. A. Petre, D.S.O., M.C., Capt. C. B. Wilson, M.C.

Associated Clubs' General Council.—Lieut.-Col. M. O. Darby, O.B.E., Lieut.-Col. Sir Francis K. McClean, A.F.C., Lieut.-Col. M. O'Gorman, C.B., F. Handley Page, C.B.E., Major H. A. Petre, D.S.O., M.C., Col. The Master of Sempill, Brig.-Gen. Lord Thomson, P.C., C.B.E., D.S.O.

Flying Services' Fund.—Lieut.-Col. A. Dore, D. C. MacLachlan, Major H. A. Petre, D.S.O., M.C.

Stewards.—The following were elected Stewards of the Club for the year 1928:—Brig.-Gen. The Duke of Atholl, K.T., G.C.V.O., C.B., D.S.O., The Rt. Hon. Lord Hugh Cecil, M.P., Brig.-Gen. Sir Capel Holden, K.C.B., F.R.S., Lieut.-Col. J. T. C. Moore-Brabazon, M.C., M.P., Lord Cozens Hardy.

THE KING'S CUP.

The race for the King's Cup graciously presented by H.M. the King will take place this year on July 20-21, 1928, over a course of approximately 1,000 miles starting and finishing at Hendon aerodrome.

The course will be divided into two sections to be completed on two consecutive days, each section being divided into stages by controls.

On July 20 aircraft will fly from Hendon to Glasgow, a distance of 520 miles, stopping at the following controls: Norwich (Mousehold), Birmingham (Castle Bromwich), Nottingham (Hucknall), Leeds (Sherburn-in-Elmet), and Newcastle-on-Tyne (Cramlington).

On July 21 aircraft will fly back to Hendon, a distance of 565 miles, by the following route: Manchester (Woodford), Bristol (Filton), Southampton (Hamble), Lympne, Brooklands (turning point only), and Hendon.

Aircraft must make a stop of twenty minutes at each of the above controls, with the exception of Renfrew, where they will remain overnight, and Brooklands, which is a turning point only.

In addition to the King's Cup, there will be a prize of £250 presented by Sir Charles Wakefield, Bt. Other prizes will be announced later.

Regulations and entry forms can be obtained from the Royal Aero Club, 3, Clifford Street, London, W.1.

THE SIDDELEY TROPHY.

The Siddeley Trophy, which has been presented by Mr. J. D. Siddeley for competition between the Light Aeroplane Clubs, will be competed for in the form of a handicap race to be run simultaneously with the King's Cup race and over the same course. Aircraft taking part in the Siddeley Tour may also compete at the same time for the King's Cup.

The Tour is open to all Light Aeroplane Clubs, and there is no restriction as to the number of competitors entered by each Club. The aircraft entered must be the property of the Club entering or of a member of the Club. The pilot must be a member of the Club entering, but paid pilot-instructors are excluded. In the case of privately-owned aircraft, the owner must be the pilot.

The race is open to aircraft, the weight in flying order of which must not exceed 1,000 lbs. This figure will not include the weights of fuel and oil and the crew, although the weight of water in the radiator shall count.

The course flown will be the same as for the King's Cup.

Full particulars and entry forms can be obtained from the Royal Aero Club, 3, Clifford Street, London, W.1.

THE ROYAL AERONAUTICAL SOCIETY.

At the meeting of the Royal Aeronautical Society on May 10, when, as announced in THE AEROPLANE of May 2, Mr. B. N. Wallis, of the Airship Guarantee Co., is to read a paper on "The Design and Construction of Airships," a number of lantern slides and a cinematograph film of great interest will be shown.

As the policy of building large airships at all, and the technical details of the design of R.100, the Airship Guarantee Co.'s new airship and of R.101, now being built at the Royal Airship Works, Cardington, have been the subject of a great deal of controversy recently, this meeting should be of unusual interest.

The meeting will be held at the Royal Society of Arts, 18, John Street, Adelphi, W.C.2, at 6.30 p.m.

THE JUPITER'S INSIDES.

The Bristol Aeroplane Co. Ltd., of Filton House, Bristol, has just issued a booklet on the "Features in the Design and Construction of the Bristol Jupiter Air-cooled Radial Engine," which contains illustrations and descriptions of all the more important details of this famous engine.

This brochure is not an engine handbook, it does not describe the engine as a whole, but it describes most of the essential details of its internal economy and explains in clear simple terms the advantages of the particular type or arrangement of each part.

The book is excellently produced and certainly gives a very graphic idea of the care and attention which have been lavished on this engine by its designers and constructors.

The Bristol Company state that they will be pleased to forward a copy of this book to any interested party, and all such will be very well advised to secure their copy quickly.

THE REID AIRCRAFT CO. LTD.

Mr. W. T. Reid, now of the Reid Aircraft Co. Ltd., Montreal, intimates that he has been fortunate in getting as his assistant in his new venture Mr. M. J. Berlyn, who was formerly his assistant in Canadian Vickers Ltd. Mr. Berlyn is one of the most promising of the younger generation of aircraft designers, and his many friends in England will be interested to hear of his latest move.

SOME RECENT BOOKS.

THE ART OF FLYING.
Capt. Norman Macmillan. 5/4 post free

THE GERMAN-ENGLISH, ENGLISH-GERMAN MILITARY DICTIONARY.
Kurt Hilmar Eitzen. 8/6 post free

AN APPROACH TO WINGED FLIGHT. J. D. Batten. 5/3 post free

PILOT'S "A" LICENCE (New Edition.)
J. F. Leeming. 3/9 post free

SKYWARDS.
Commander R. Byrd. 15/9 post free

LETTERS FROM A FLYING OFFICER.
R. Stuart Wortley. 8/10 post free

AERIAL PHOTOGRAPHY.
Clarence Winchester & F. L. Wills.
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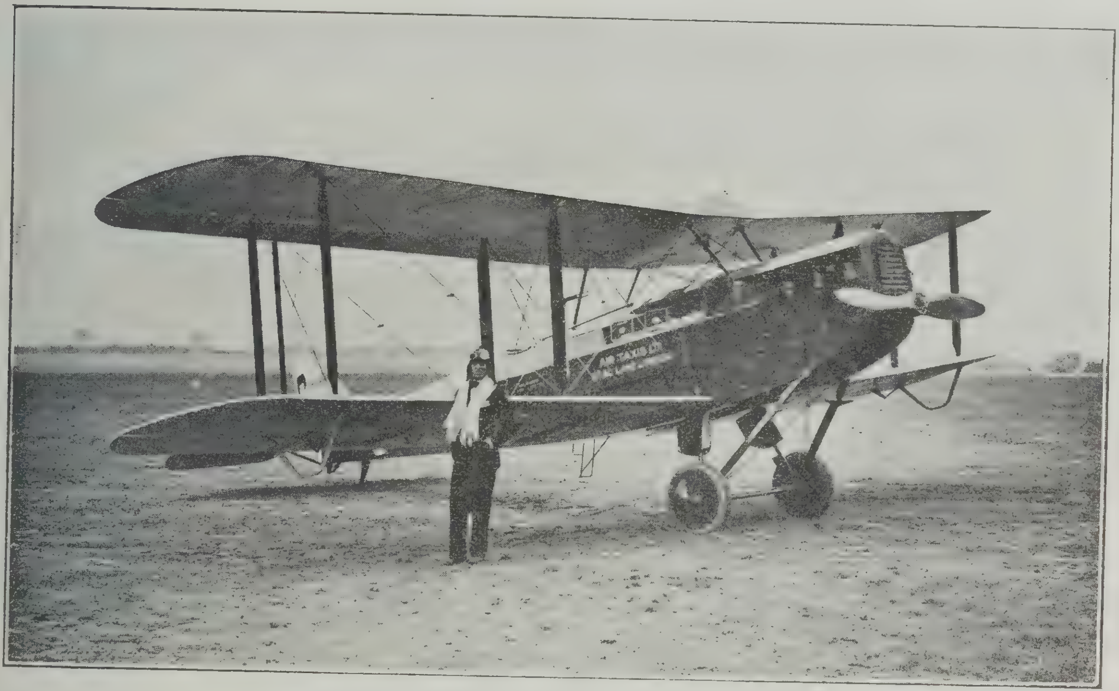

The sole reason for the decision of AIR TAXIS LTD. to dispose of this machine is that they have found it necessary to replace it by another having larger seating capacity.

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Works and Railways Department.—(Installation of Aerodrome Bulk Petrol Storage Plants).

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THE BRISTOL PAGEANT.

THE BRISTOL MEETING.—A ground view of Filton Aerodrome taken during the Bristol Meeting.

The first of the four official Light Aeroplane Club meetings took place at Filton Aerodrome, Bristol, on May 5. This meeting was organised by the Bristol and Wessex Aeroplane Club, and there is every reason to believe that it proved a financial success.

Proceedings began officially at 11.00 hrs. with the heats for the Talbot O'Farrell Challenge Trophy, with joy-riding in the Imperial Airways "City of New York," with Mr. Jones in charge, and in two Avros of the Surrey Flying Services. Concerning the heats, mention must be made of Miss O'Brien's performance. She received a very nasty cut on the hand while starting up her Moth, but after having it bound up, carried on, and eventually reached the final. The first heat was won by Mr. C. F. Uwins on the very much cleaned-up version of the Bristol training machine at 109 m.p.h., the second by the R.A.E. Aero Club Avian, the third by Flt. Lt. Bonham Carter on the Parnall Imp at 101—an outstanding performance, which gives one furiously to think of what the machine will be capable when in racing trim—and the fourth by Mr. "Brooklyn" on a Westland Widgeon.

These results left Miss O'Brien on the limit mark for the final, while the unfortunate R.A.E. Aero Club Avian at scratch was compelled to concede 53 secs. to the Bristol training machine.

Just before lunch Mr. Martin on his Club's Moth had to execute a sudden down-wind landing, which he did very successfully. It transpired that a large piece was missing from the engine altogether.

At 14.90 hrs. the serious business of the afternoon began with the Fly Past, in which twelve machines took part. With the exception of the Parnall Imp and certain ingenious devices on the Bristol training machine for the cooling of the Lucifer crankcase, there was nothing particularly novel or calling for comment. Flt. Lt. S. N. Webster was in the Bristol Club Moth, a fact which was made public by the B.B.C. announcers.

The race for the Selfridge Cup was the next item on the list, and resulted in a win for Mr. H. J. Willis (Midland Club Moth) at 85 m.p.h., Dr. Dixon (Newcastle Club Moth) being second, and R. Williams (Lancashire Club Avian) third. The course was approximately 15 miles, with two turning points, at Yate aerodrome and Alverston. In the O'Farrell Cup the same course was covered twice.

Formation aerobatics were then given by three Woodcocks from No. 17 (Fighter) Squadron.

At about this point Sir Sefton Brancker arrived on the Air Ministry Moth accompanied by Mr. R. S. Mealing, but owing to a dinner engagement in town he was unable to remain until the end. Mr. Hubert Broad was down for the next

THE BRISTOL MEETING.—An aerial view of Filton Aerodrome taken just before the opening of the programme showing a few of the aircraft present. This was taken from a D.H. Moth piloted by Mr. A. S. White.
—("*Aeroplane*" *photograph.*)

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number, but was understood to have been held up at Stag Lane, whereupon Sq. Ldr. T. H. England took over the slotted Moth and gave an impressive demonstration, which the crowd really seemed to appreciate. Mr. Broad arrived just as Sq. Ldr. England was taking the air, and a little later gave his usual perfect display of aerobatics. By the way, one hopes that the little idea of having different registration marks on the fuselage and wings will be overlooked by the gentry who do these things with other people's motor cars!

There was no doubt that the crowd obtained quite a thrill from the Balloon Bursting Competition—much more than some people imagined. The result was a tie between Mr. H. A. Brown (Lancashire Club) and Mr. J. D. Parkinson (Newcastle Club) with nine balloons each. Flt. Lt. Crawford (Hampshire Club) being next with eight. On a toss up it appeared that Mr. Brown got the Cup and Mr. Parkinson the cheque. Dr. Whitehead Reid dropped his Widgeon out of the sky somewhat heavily and to the undoing of his undercarriage, one side of which collapsed.

A good sized thunderstorm which had been accumulating over Bristol way most of the afternoon now made up its mind to supply all necessary stage effects, and remained threateningly for the rest of the day.

Two of the Woodcocks went up for a scrap in the sixth event, but apparently the guns of one machine were out of action.

The Final of the Talbot O'Farrell Open Handicap produced a fine finish for second and third places, the Parnall Imp, piloted by Flt. Lt. Bonham Carter, just managing to squeeze home in front of Mr. "Brooklyn's" Widgeon. As expected Mr. Uwins on the Bristol took the first place, a comfortable 39 secs. ahead of the indefatigable Imp. The speeds were 108, 100¾, and 102 m.p.h. respectively.

Wing-walking was duly accomplished by the Surrey Flying Services, but the parachute drop by "Miss June" was not proceeded with—which was probably just as well. The Final event was a "set-piece" in which the Woodcocks bombed a canvas tank what time two armoured cars of the Gloucestershire Hussars performed excited manœuvres round about.

The Duke and Duchess of Beaufort were present during the afternoon and Her Grace kindly presented the prizes. The Mayor and Mayoress also attended and His Worship went up in the Club Moth. Col. Woodcock, M.P., the hard-worked President of the Bristol and Wessex Club, was heartily thanked at the subsequent dinner at the Grand Hotel, as was everyone else connected with the proceedings, and a few who were not.

The attendance on Saturday afternoon was "officially estimated at 25,000"—figures which speak for themselves as to the success of the Meeting.—G. S. F.

INTRODUCING THE SLOT TO EUROPE.

Reports of the remarkable results achieved by Handley Page Ltd. with the automatic slot have aroused so much interest throughout Europe, and have brought to that firm so many requests for information from both Governments and private concerns abroad, that a tour of demonstration to cover France, Spain, Switzerland, Italy, Yugo-Slavia, Rumania, Hungary, Austria, Czechoslovakia, Germany, Poland, Holland, and Belgium has been arranged in order that aviation interests in these countries may see and test for themselves a machine fitted with this device.

For this purpose the De Havilland Aircraft Co. have lent one of the "X" type Moths fitted with automatic slots and with the new divided-axle undercarriage to Handley Page Ltd., and Sq. Ldr. T. H. England is to fly it over an itinerary covering all the countries mentioned.

The tour should have started from Cricklewood on Tuesday, May 8, but unfortunately a minor mishap, recorded elsewhere, will delay the start for a few days.

The Moth in the unslotted condition is already well known over a wide area in Europe, but to make it clear even to those who are unacquainted with this type of machine, how vast is the effect of the slot, a couple of links are fitted on each auxiliary surface by which the slots may be locked closed, and the machine flown either with or without the slot in action.

Every possible opportunity is to be given during the tour to persuade the test-pilots of the various air services, aircraft constructors, etc., to fly this machine and satisfy themselves of the complete efficacy of the automatic slot.

Sq. Ldr. England expects to spend about two months on this trip, and will put in several days in all the chief aeronautical centres of the countries visited. He is carrying very little in the way of spares, relying on the Moth and the Cirrus engine to give the minimum of trouble in service. He is however carrying with him a tool-kit of a very complete nature, spare sparking plugs, tappets, and the like, and a set of screw pickets for pegging his machine out in places where sheds do not exist.

MR. STACK'S TOUR.

On April 30, Mr. Neville Stack, who is making a tour on an Avro Avian accompanied by Mr. E. C. Bowyer of *The Daily News*, flew from Getafe aerodrome, Madrid, to Seville. On May 1 he flew to Oran, in Algiers, with an intermediate landing at Mellila (Morocco).

On May 2 the flight was continued to Algiers, but a gale with low clouds over the mountains prevented further progress on the following day.

On May 4 the tourists left Algiers for Tunis, and later crossed from Tunis to Catania (Sicily).

Leaving Catania on the morning of May 5, Rome was reached that evening, after an intermediate landing at Capua.

On May 6 the homeward journey was continued as far as Marseilles, with an intermediate landing at Pisa.

On May 7 France was crossed from Marseilles to Paris with landings at Lyons and Dijon in 7 hours 10 minutes flying time.

ENGLAND—AUSTRALIA.

Wing-Cdr. E. R. Manning, D.S.O., M.C., R.A.F., who left Lympne on April 23, flying a Westland Widgeon (A.D.C. Cirrus engine), in an attempt to fly to Australia, and was held up at Tunis with a broken tail-skid and engine trouble, completed his repairs on May 5 and left for Tripoli on May 6.

An *Exchange Telegraph* message states that Wing-Cdr. Manning crashed at Homs, Tripoli, but is unhurt.

In a message to A.D.C. Aircraft Ltd. from Tunis Wing-Cdr. Manning stated that on taking down his engine he had discovered the crank-case half full of water.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending May 6.

Flying Time 70 hr. 40 min. *Instruction* 50 hr. 5 min. *Soloists* 20 hr. 35 min. *Instruction.—With Mr. S. L. F. St. Barbe*—Miss Wilson, Miss James, Miss Johnson, Messrs. J. A. Murphy, J. R. Rymill, P. A. Wills, G. A. Stedall, J. V. K. Watson, E. R. Andrews, R. L. Portway, A. S. Millar, R. Drysdale-Smith, J. R. A. Stroyan, R. Ward, F. C. Fisher, G. C. Gotheridge, L. G. Sykes, H. B. Saunders, B. L. Middleton, G. Lyon, I. D. Lloyd, A. D. Blumlein, R. Richmond-Brown, S. Hansel, E. Davis, J. A. Crane, H. Sutton, Dr. Cook. *With Mr. F. R. Matthews*—Miss Fletcher, Miss Wilson, Mrs. Wilcoxon, Miss James, Messrs. E. R. Andrews, T. A. Browne, A. J. Richardson, B. L. Middleton, S. Hansel, J. A. Murphy, H. R. Presland, R. O. Wilcoxon, G. E. Clair, P. A. Wills, G. Peckham, R. Ward, A. S. Millar, R. Richmond-Brown, H. Sutton, G. Haydon, J. R. A. Stroyan. *Soloists.*—Messrs. W. Roche-Kelly, R. Sanders-Clark, J. J. Hofer, R. Ward, F. C. Fisher, P. W. Hoare, J. A. Brewster, B. B. Tucker, J. C. V. K. Watson, H. B. Michelmore, R. C. Presland, E. E. Stammers, C. Paul, H. M. Samuelson, W. L. M. O'Connor, Lord M. Douglas-Hamilton, Dr. Cook, Major Beaumont.

Flying Return for the month of April.

Total Flying Time 166 hr. 5 min. *Instruction* 95 hr. 10 min. *"A" Licence Soloists* 33 hr. 55 min. *Practice Soloists* 10 hr. 40 min. *Passenger Flights* 14 hr. 30 min. *Test Flights* 11 hr. 50 min.

The flying time for the month of April just exceeds that for the corresponding month last year, and the Instructors, St. Barbe and Matthews, are to be congratulated on their first month's work together.

Hampshire Air Pageant.—The Club will be sending a Moth to the Hampshire Air Pageant on May 28. Members wishing to take part are requested to forward their names to the Secretary.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending May 5.

Flying Time 38 hr. 45 min. *Instruction* 12 hr. 25 min. *Soloists* 23 hr. 50 min. *Passengers* 2 hr. 30 min. *Instruction.—With Mr. Beck*—Messrs. Ambler, Bamford, Batcock, Bell, Blackburn, Collins, A. Crowther, Dr. Daly, Messrs. Dane, Ellison, Hepworth, M. B. Lax, Rowley, Senior, Shires, Sugden, Watson, Miss Woodhead. *Soloists.*—Messrs. Ambler, A. Crowther, H. Crowther, Dick, Humpheries. *"A" Pilots.*—Messrs. Clayton, Dawson, Ellison, Lister, Mann, Thomson, Watson, Wood. *"B" Pilot.*—Mr. Fielden. *Passengers.*—12.

Another cheerful week to record, our only drawback being that we had only two machines. We are hoping to get a third, bringing us up to establishment during the week.

Mr. Harry Crowther and Mr. Geoffrey Ambler did their "A" Licence tests with admirable skill, and given the continuance of "height test" weather, we shall have two more in the course of a day or two.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending May 5.

Flying Time 18 hr. 1 min. *Instruction.—With Flt. Lt. Rose*—Messrs. E. P. Lane, G. E. C. Hill, W. M. Morris, H. Coleman, S. G. Hall, T. H. Drury, S. Duckitt, A. E. Coltman, T. N. Khatri, Capt. J. C. Chaytor. *Soloists.*—Messrs. R. L. Jackson, W. Swann, S. H. Smith, R. D. Bednell, W. M. Morris, H. J. Willis, H. Tipper, G. Robson, E. D. Wynn, J. Rowley, E. P. Lane. *No. of Passenger Flights.*—9.

On Sunday Messrs. W. M. Morris and E. P. Lane were launched solo and both put up a creditable performance.

On Friday Flt. Lt. Rose flew LW to Filton for the Bristol Air Pageant.

Mr. H. J. Willis, who represented the Club in the Short Handicap Race for the "Selfridge" Cup, won the race at an average speed of 87 m.p.h.

Britain's Air Supremacy
Three World's Records

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BY APPOINTMENT TO HIS MAJESTY THE KING

Capt. H. Broad, flying a British Napier engined De Havilland "Hound," broke (subject to homologation) the following air records on April 27th, 1928:—

Carrying 1,000 Kilograms (2,210 lbs.)

500 Kilometres - 158.656 m.p.h.
Previous record (France) - 144 m.p.h.

1,000 Kilometres - 160.861 m.p.h.
Previous record (France) - 153 m.p.h.

Carrying 500 Kilograms.

500 Kilometres - - - 158.656 m.p.h.
Previous record (Czecho-Slovakia) - - 155 m.p.h.

As usual, these records were made on—

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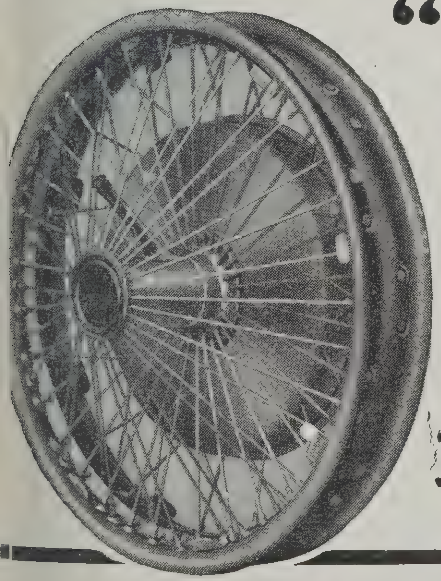

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C.H. 6

Mr. W. H. Sutcliffe (late Sjt.-Pilot, R.A.F.) has been appointed Assistant Instructor and took up his duties on Sunday.

The new "X" Moth very kindly presented to this Club by the proprietors of the *Wolverhampton Star* is being delivered this week.

The total flying time for April is 81 hr. 9 min.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending May 6.

Flying Time 42 hr. 10 min. *Instruction* 15 hr. 15 min. *"A" Pilots* 12 hr. 55 min. *Soloists* 4 hr. 30 min. *Passenger Flights* 8 hr. 25 min. *Tests* 1 hr. 45 min. *Instruction.—With Flt. Lt. Swoffer—*23. *No. of Passenger Flights.—*28.

We created another Club Record by putting in 17 flying hours for Sunday.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending May 6.

Flying Time 16 hr. 40 min. *Instruction.—With Mr. Fry—*Messrs. C. Bethell, C. Cleasby, H. Neave, A. G. Woods, G. Barker, C. Girling, A. A. Rice, R. Hare, A. J. K. Finch, E. Lambert, G. Surtees. *Soloists.—*Messrs. W. A. Ramsay, F. Gough, R. Potter, W. P. Cubitt, N. Brett, H. Pank, C. Gowing, R. Harmer, E. Lambert, R. W. Moore, G. F. Surtees.

We are pleased to report a weekly increase in membership and a very satisfactory state of affairs generally. The new Club House opens on May 10, Hot and Cold luncheons always available, accommodation to seat 40 persons.

We have sold the Renault Avro and shall, with the money so kindly given us by Mr. Henry N. Holmes, be open to consider quotations for another light 'plane on June 1.

Our Moth, G-EBQX, is promised back before Whitsun in time for the visit of H.R.H. the Prince of Wales on May 30. On this occasion we shall be pleased to see as many visiting aircraft as possible. Most of the manufacturers are sending special machines, and these will be inspected by the Prince.

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending May 5

Flying Time 10 hr. *Instruction* 3 hr. 50 min. *"A" and "B" Pilots* 3 hr. 25 min. *Soloists* 1 hr. 40 min. *Passenger Flight* 45 min. *Tests* 20 min. *Instruction.—With Mr. Lowdel—*Miss Sylvia Edwards, Miss Rhodes, Dr. Mildred Yate, Mrs. Young, Dr. Dunn, Messrs. Hanson, Goodwin, Smith, and Marriage. *Soloists.—*Messrs. Brown, Hanson, Jolly, Peck and Verney. *"A" and "B" Pilots.—*Dr. Sleigh, Messrs. Prentice and Schofield. *Passengers.—*7.

Dr. Mildred Yate and Mrs. Young began their course of instruction during the week. One new pilot and one new associate member were enrolled during the week and several inquiries have been received from prospective members.

A routine renewal of control cables on RE and a difference of opinion between a tail-skid and the aerodrome somewhat curtailed instructional work during the week.

The Scottish Flying Club.

[Hon. Sec.: H. W. Smith, 101, St. Vincent Street, Glasgow.]

Report for the month of April

Total Hours Flown 125 hr. 35 min. *Members under Instruction* 55. *Soloists* 49. *Total number of flights undertaken* 280. *No. of days on which flying was possible* 25. *No. of pupils who secured "A" Licence* 9.

The reduction in the number of pupils under instruction is due to a large number of these having secured the licence and they are therefore not entered in the statistics. The two Moths were only in active operation together on three days. The rest of the month, only one Moth was in operation owing to minor accidents of one or the other.

The month of April saw the first bunch of our *ab initio* pilots coming forward for their first solo flights, and as is usual in such cases, undercarriages and propellors suffered. Nevertheless, a good number of hours were flown as will be seen from the statistics appended. In all, five *ab initio* members secured their licence, they being Messrs. Harrington, McNab, Rushton, Downing and Young. Besides these, four members who had flown before got their licence, these being Messrs. Yuill, Horsburgh, Donald and Lang.

For a good deal of the time the usual April weather prevailed and the aerodrome was more like a bog than anything else; and it is a wonder that there were not more minor accidents. On April 28 an R.A.F. machine very unkindly taxied into G-EBVT while it was reposing peacefully on the ground, causing considerable damage.

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

Report for week ending May 6.

Flying Time 24 hr. 15 min. *Dual* 8 hr. 15 min. *Soloists* 11 hr. *Passenger Flying* 5 hr.

On May 2 Messrs. Miles and Bellairs flew to Croydon to the opening of the new buildings on VA, Mr. Bellair's new Avian.

On Sunday, Mr. Fred Raynham, who is quartered with us for a few weeks, gave a thrilling demonstration of bursting balloons, attached with string to a pylon, with his wing tips, and later Mr. Miles tried his luck, and his balloon victims were quite in accordance with the high standard of Club work.

THE CANADIAN FLYING CLUBS.

The Saskatoon Aero Club.

The honour of being the first organisation to comply fully with the regulations laid down for Light Aeroplane Clubs by the Department of National Defence has gone to the Saskatoon Aero Club. It has been allotted two D.H. Moths (A.D.C. Cirrus engines) and its instructor, Mr. J. F. Bythell, has been instructed to report to Camp Borden, the R.C.A.F., F.T.S., for a special course of flying instruction.

This course was established for the purpose of training Club instructors, and it opened on Mar. 12 with six pupils representing Toronto, Ottawa, Hamilton, Saskatoon, Montreal and Halifax, but it is understood that the last two withdrew before completing the course. Mr. L. Arden Smith, the president of the Saskatoon Aero Club, has received a letter of congratulation from the Department of Nationa Defence on being the first Club to qualify for the grant of light ai craft. In commenting on the fact that, in spite of the competition o the larger cities of the Dominion, Saskatoon, one of the youngest an smallest, should be the first to be supplied with aircraft, Mr. Smit said that the credit was largely due to a group of twenty Saskatoo business men who had aided the Club.

The first batch of Canadian Flying Club Instructors at Camp Borden. Seated: (from left to right) second, Toronto; fourth, Ottawa; fifth, Hamilton. Standing: (on left) the Saskatoon Club instructor, Mr. J. F. Bythell. The remainder are R.C.A.F. officers.

Soon after its organisation the Club was incorporated in accordanc with the laws of the province and the following directors and officer of the Club were appointed: Mr. L. Arden Smith (President); Mr. N. C Byers (Vice-President); Mr. B. R. Masecar (Secretary-Treasurer); Messrs E. O. Fuller, J. J. Olmstead, J. East and C. R. McCullagh. Immediatel after the incorporation classes in elementary aviation were begun a the University. It is expected that flying instruction would begin o or about May 1.

The Hamilton Aero Club.

The Hamilton Aero Club has been formed under Major Robert Dodd (late 48 Sqdn., R.F.C. and R.C.A.F.), who is now at Camp Borde taking an instructor's course. On April 14 the Club had a membershi of 110 and it is hoped that this will increase considerably when flyin begins. Through the courtesy of the Parks Board, the Club has bee granted the temporary use of Stewart Park for one year and it i now engaged on erecting a hangar and clearing some trees away. I is expected that the two Moths allotted the Club will arrive on o about May 1 and flying will begin as soon as possible after this dat

The officers of the Club are: Major R. Dodds (President); Majo Benson Walker (late R.N.A.S.) (Vice-President); Mr. Lloyd H. Smit (late 60 Sqdn., R.F.C.) (Treasurer); Mr. Beamer W. Hopkins (lat R.A.F.) (Secretary); Mr. Robert O. Denman (late 148 Sqdn., R.F.C. and Mr. S. B. Nelson (late 41, 63, and 84 Sqdns., R.F.C.) (Directors).

The subscription for associate membership is $10, and those who wis to fly will pay in addition an initiation fee of $15 as well as the nece sary fees as they fly. The cost of flying has not yet been decided, bu it is estimated that it will not exceed $15 per hour (dual) and $10 pe hour (solo).

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending April 29.

Flying Time 181 hr. 40 min. *Instruction—Dual,* 75 hr. 5 min. *Solo,* 68 hr. 40 min. *Other Flying* 37 hr. 55 min.

The outstanding feature of the week was the brilliant performan of the De Havilland "Hound" machine which, piloted by Mr. H. Broad, captured three World's Records for Great Britain.

Tests and demonstrations were continued with the "slotted winged Moth, and the new De Havilland four-cylinder "Gypsy" engine wa also extensively demonstrated, to the very great satisfaction of a concerned.

Nine new Moths were tested and despatched, thereby rigidly adherin to our Moth production programme.

Our School has put in a really hard week's work and there is ever possibility of April's figures surpassing the best of any previous month Certainly the number of flying aspirants shows an increase whic speaks well for the future of civil aviation.

Report for week ending May 3.

Flying Time 109 hr. 35 min. *Instruction—Dual,* 57 hr. 40 min. *Solo,* 35 hr. 45 min. *Other Flying* 16 hr. 10 min.

Four pupils made successful first solos and one pupil obtained hi "A" Licence. Six new Moths were tested during the week.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

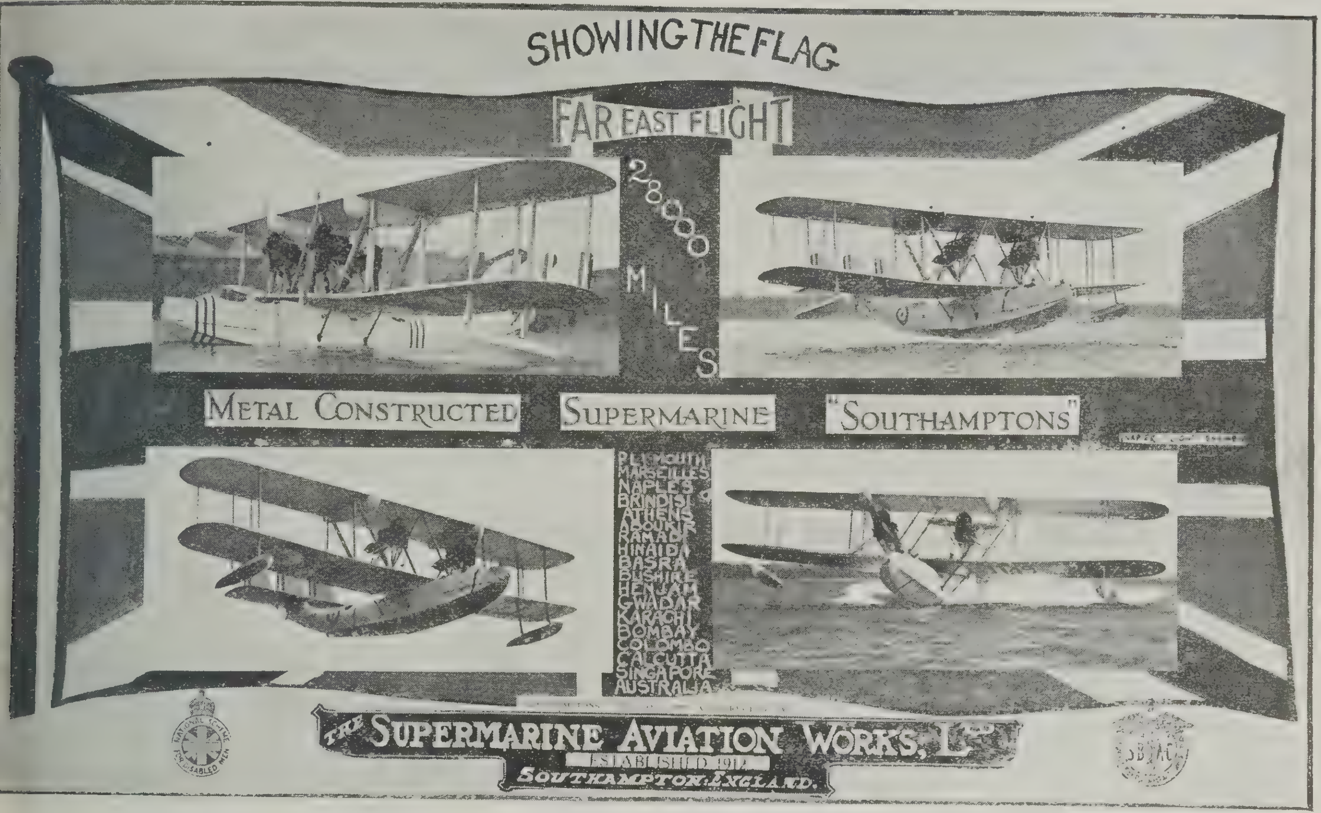
Report for week ending May 3.

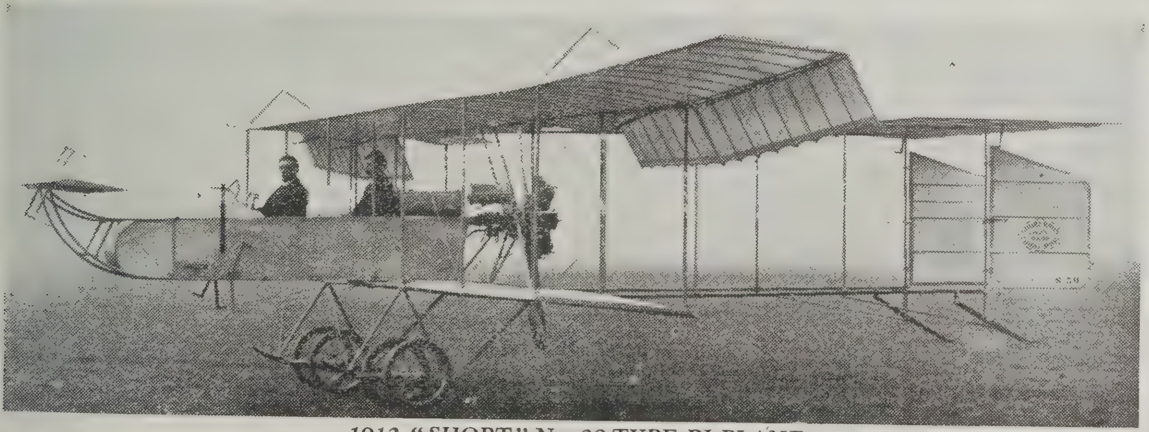
Flying Time 33 hr. 5 min. *Soloists* 8 hr. 40 min. *Instruction.—Wit Col. G. L. P. Henderson—*Miss Kidston. *With Mr. H. D. Davis—*Messrs. Hughes, Allen, Hsiao, Quilter, Hamilton, Dr. Wall, Messrs Whiteley, Mitchell, Habsburg, Dawson. *With Mr. A. E. Golds—*Messrs. Payne, Crabtree, Mitchell, Hughes, Dr. Forsyth.

Mr. Quilter has now passed all his flying tests for his R.A.C Certificate and holds the School record for height on his test flight.

Mr. Hsiao, who had considerable difficulty in his early stages treated his first solo flight as an excellent approach and three-poin landing.

Col. G. L. P. Henderson has now begun active operations a Brooklands.





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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 9; Monday, 18; Tuesday, 24; Wednesday 23; Thursday, 24; Friday, 24; Saturday, 23.

IMPERIAL AIRWAYS LTD.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 51, passengers 434, freight 16 tons.
AIR UNION:
Paris—London: Machines 39, passengers 133, freight 14½ tons.
K.L.M.:
Amsterdam—Rotterdam—London: Machines 14, passengers 88, freight 4¼ tons.
SABENA:
Brussels—London: Machines 12, passengers 55, freight 1 ton.
DEUTSCHE LUFTHANSA AG.:
Amsterdam—London: Machines 25, passengers 49.
PRIVATE:
Machines 2, passengers 0

Total number of trips by British Machines, 53, carrying 434 passengers. Foreign Machines, 92, carrying 325 passsengers.

COMPARATIVE FIGURES.

Week ending May 6:
Machines, 145; Passengers, 759; Crews, 278; Total personnel, 1,037.
Corresponding week, 1927:
Machines, 121; Passengers, 716; Crews, 201, Total personnel, 917.
Corresponding week, 1926 (*General Strike*):
Machines, 186; Passengers, 1,085; Crews, 232; Total personnel, 1,327.
Corresponding week 1925:
Machines, 125; Passengers, 386; Crews, 158; Total personnel, 544.
Corresponding week, 1924:
Machines, 86; Passengers, 211; Crews, 128; Total personnel, 339.
Corresponding week, 1923:
Machines, 109; Passengers, 444; Crews, 177; Total personnel, 621.
Corresponding week, 1922:
Machines, 114; Passengers, 215; Crews, 186; Total personnel, 401.
Corresponding week, 1921:
Machines, 75; Passengers, 230; Crews, 90; Total personnel, 320.
Corresponding week, 1920:
Machines, 84; Passengers, 103; Crews, 87; Total personnel, 190.

Croydon Notes.

Mr. R. H. Macintosh passed through Croydon at the beginning of the week, arriving at Croydon on his long-distance Fokker on Sunday afternoon after a non-stop flight from Berlin in a little under five hours. On Monday he left for Bristol, where his Jupiter engine is to undergo a thorough overhaul. For what purpose the machine is being prepared is not at present known, though rumour favours another attempt on the Westerly crossing of the Atlantic.

Two more new pilots have recently taken over regular flying on Imperial Airways. These are Mr. W. H. Alger and Mr. J. Spafford. Both are ex-serjeant-pilots of the R.A.F. who have much experience of flying heavy bombing machines, and both of them are doing extremely well at their new job.

The official opening of the aerodrome buildings on Wednesday was the occasion for the usual parade of aircraft, which on this occasion was almost entirely composed of real civil aircraft. The most striking novelty present was the new three-engined Fokker for Mr. Van Lear Black's use on the trip he is shortly to make to Cape Town, and thence probably via India to China and back.

This machine is an F.VII bearing the registration H-NADP, which is the same as that borne by the F.VII which took Mr. Black to the Dutch East Indies. The machine however is new and has had the old markings transferred to it for sentimental reasons.

The new H-NADP is fitted with three Gnôme-Rhône-built Bristol Titan engines, the first of this type yet seen in public in England. The Titan is essentially a five-cylinder version of the famous Jupiter, using the same cylinders and many other details, and is rated at 260 h.p. Pilots who have flown this machine are exceedingly pleased with its smooth running.

The new hotel which is now in part working order is a very definite improvement to the amenities of Croydon. It is laid out on a large scale, is excellently decorated and furnished. The dining room—which is on the first floor—looks out over the aerodrome and gives a view of all that may be going on scarcely inferior to that from the Control Tower. Lunches, teas and dinners are to be served in fine weather on the flat roof of the building, and from here a look out all round definitely better than that from the Control Tower is given.

As the hotel, unlike the old aerodrome hotel, offers full facilities for the refreshment of the general public and is on a much-used road, there is no doubt that many passers-by not specially interested in aviation will be led to halt there for refreshment and in satisfying their appetites, be induced to take a livelier interest in aviation.

A CANADIAN AMALGAMATION.

Western Canada Airways Ltd. of Winnepeg, the largest commercial aviation company in the Dominion, has purchased Pacific Airways Ltd., of Vancouver, B.C.

Western Canada Airways Ltd. was established in 1926 by Capt. H. A. Oaks and has rapidly developed into the biggest operators of commercial aircraft in Canada. Since the beginning of this year the company has acquired over twenty new aircraft.

Pacific Airways Ltd. was managed by Major D. H. MacLaren, D.S.O., M.C., D.F.C., and operated an HS-2L flying-boat and a D.H. Moth on freight and passenger carrying, flying instruction, forest sketching, exploration and reconnaissance, aerial photography, etc.

U.S. CIVIL AIR ACCIDENTS.

According to statistics published by the Aeronautics Branch of the U.S. Department of Commerce, there were 200 aeroplane accidents in the United States during 1927, involving 164 fatalities of whom 65 were pilots and 99 passengers. Of the total 200 accidents, 34, involving 33 deaths, were with licensed aircraft, and 166, involving 131 deaths, were with aircraft unlicensed by the Department of Commerce. Of the pilots involved in these accidents, 35 were licensed and 165 unlicensed.

Of the probable causes of the total number of accidents, 100 were due to errors of judgment, 43 to mechanical failure, 23 to structural failure, 12 to weather, 14 to other causes, and 8 unknown.

Of the probable causes of the 164 accidents involving death 79 were due to errors of judgment, 22 to mechanical failure, 22 to structural failure, 9 to weather, 13 to other causes, and 19 unknown. The above figures include all deaths due to trans-oceanic attempts during 1927.

Offset against the above figures which cover every form of flying it is interesting to note that in the Government Air Mail service which finally ceased operations on Sept. 1, 1927, there was one fatality to 141,381 pilot-passenger-miles flown and in Air Transport operations under contract to the U.S. Post Office there were 6 fatalities in a total of 8,485,980 pilot-passenger-miles flown.

This latter figure becomes more impressive when it is realised that the majority of the services operate day and night throughout the year.

SATISFACTION.

LONDON AERO CLUB LTD.—Satisfaction in full on July 31, 1927, of debenture dated Oct. 11, 1926, securing not more than £2,000. (Notice filed April 25, 1928.)

PERSONAL NOTICES.

MARRIAGES.

MACKAY—COMPER.—On April 30, at All Saints', Upper Norwood, Flt. Lt. Edward Percy Mackay, R.A.F., to Ursula, daughter of Mr. and Mrs. J. N. Comper.

POPE—YOUNG.—On April 21, at St. Mary's Church, Ipswich, Flt. Lt. S. L. G. Pope, D.F.C., R.A.F., to Pamela Louise Young, daughter of Dr. and Mrs. Cameron Young, of Ipswich. The best man was Sq. Ldr. A. G. Jones-Williams, M.C.

FORTHCOMING MARRIAGES.

BRIGGS—MANSFIELD.—The marriage arranged between Flt. Lt. C. F. Briggs, R.A.F.O., youngest son of the late Mr. Henry Briggs and Mrs. Briggs, of Leighton Buzzard, and Bernice Zoë, only child of the late Mr. Ernest Mansfield and Mrs. Mansfield, of 3, Hyde Park Mansions, W., will take place on May 18, in Bombay.

HAMPTON—BODIMEADE.—The engagement is announced of Flt. Lt. H. N. Hampton, D.F.C., R.A.F., elder son of Mr. and Mrs S. T. Hampton, of Bishop's Stortford, and Marjorie, elder daughter of Mr. and Mrs. F. E. Bodimeade, of Kenton, Harrow.

BIRTHS.

BROWN.—On May 4, at 3, Wilbraham Place, Sloane Street, S.W.1, to Phyllis (*née* Widdowson), wife of Flt. Lt. Leslie O. Brown, D.S.C., A.F.C., R.A.F.—a son.

MACKEY.—On May 2, at 3, Wilbraham Place, Sloane Street, S.W.1, to Kathleen, wife of Sq. Ldr. C. W. Mackey, R.A.F.—a son.

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INCORPORATING AERONAUTICAL ENGINEERING
Edited by C. G. Grey

Vol. XXXIV. No. 20. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

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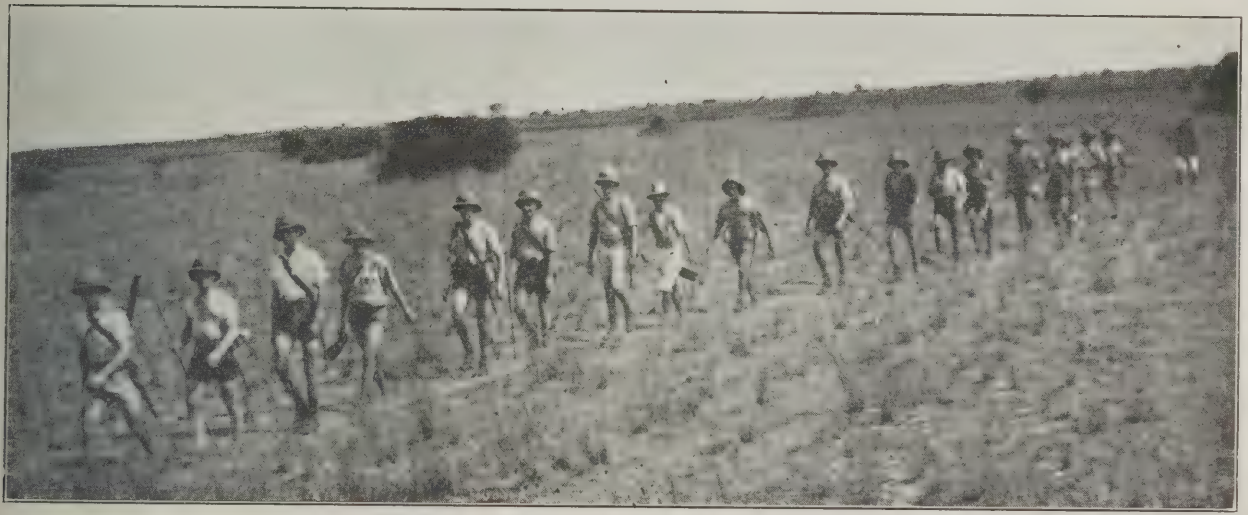
(Kipling.)



THE REASON WHY:—A detachment of No. 47 (Bombing) Squadron trekking through five miles of swamp country up to Lake Gow during the recent operations in the Sudan. This shows why the men of the R.A.F. must be Grade A Infantrymen as well as being competent aircraftmen.

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B. Hinkler.

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MAY 16, 1928.

THE AEROPLANE

VOL. XXXIV No. 20.

Incorporating
Aeronautical Engineering

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON FURTHER CONSIDERATIONS OF THE NEXT WAR.—I.

Somewhere in one of his entertaining books the Honourable Maurice Baring, quoting somebody else, says: "One approaches every war as a novice." There are two reasons for the truth of this axiom. One is that nobody can be sure of the precise conditions under which the next war will be fought. The other is that the training of all fighting forces is almost always based on the idea of avoiding a repetition of the mistakes of the last war. Some of the lessons learned from these mistakes are useful. But others turn out to be disastrous. For invariably a new war produces new conditions which can hardly be foreseen.

There is however a possibility of avoiding some mistakes in a new war by adopting as a second axiom the theory that most of what one learned in the last year will be useless. At any rate, those responsible for the preparations for a new war will be wise to look with deep suspicion on the development of any methods of war which, if they had been adopted in the last war, would certainly have hastened the winning of it.

Consequently one proposes to review some of the fixed ideas which we acquired from the War 1914-18, and to show how they may be entirely misleading in the Next War, and to suggest a few alterations to them. But first we shall do well to consider the nature of the Next War and try to form some idea of how, why and where it may happen.

WORKING UP FOR WAR.

At the present moment foreign affairs in general seem o be working steadily towards the outbreak of sundry wars which may quite well develop into that World War between the Yellow Peoples and the White Peoples which has been prophesied ever since the end of the inter-tribal brawl of 1914-18,—though in fact it is only a renewal of the great racial conflict between the Yellow and the White (or between Japhet and Shem, if you like it better that way) which has been going on at intervals ever since History began.

For a good many years there has been a sort of rumour going around to the effect that the Admiralty has been expecting that war to begin some time in 1928. And, whatever may have been the errors of the Admiralty in the execution of the last war, there is no doubt that the Admiralty did foresee the outbreak of war in 1914,—witness the mobilisation of the Fleet by Prince Louis of Battenberg and Mr. Churchill in July. Nor is there any doubt that the Admiralty Intelligence Department was one of the most amazingly efficient organisations of the War. Consequently if the aforesaid rumour does truly present the Admiralty's opinion it is well worth taking seriously as a short-date prophecy.

On the other hand, for those who prefer long-date prophecies, there are the prophetic efforts which have been dug out of the Great Pyramid and foretell the beginning of the Great World War specifically for May 29, 1928. The newspapers have had a good deal to say about these prophecies of late, but one has been too busy to study them. In any case, what with the various adjustments of the calendar and changes in the systems of counting the years and months and days since the Pyramidal Prophets were at work, one does not personally feel inclined to gamble on their accuracy. One prefers to look at facts as they exist to-day.

Readers of THE AEROPLANE at any rate have had set before them fairly often of recent years the general theory of a war between the Yellow Races and the White, in which Russia would be fighting the civilised nations of Western Europe, and Japan would be fighting America and the British Empire for the control of the Pacific.

THE RUSSIAN SITUATION.

So far as Russia is concerned the position is becoming clearer and clearer every day. During the past few weeks paragraphs have appeared in a number of newspapers, and have

SWISS ENTERPRISE.—A Fokker F.VII (450 h.p. Gnôme-Rhône Jupiter engine) belonging to the Swiss Air Transport Company "Balair" on the ice at St. Moritz, where it was engaged in taking up passengers during the season.

been duly quoted in The Aeroplane showing the general trend of Russian policy.

The organisation known as the Osoaviakhim, which is a department whose business it is to develop at the same time air war and chemical war has been very active. Meetings have been held in various important cities in Russia to extract from the populace subscriptions for the purchase of aircraft to be used against the *bourgeois* nations of the West. A great campaign for the extension of the Red Army's Air Force is being run in Russia with the slogan, or title, "Our Reply to Chamberlain,"—because Sir Austin Chamberlain has not welcomed the Russians with open arms into the Companionship of the Nations.

With that simple brand of low cunning which is characteristic of the square-headed peoples the Russians put forward to the League of Nations quite absurd proposals for international disarmament, and when these proposals were naturally turned down, as the Russians well knew they would be, the Soviet Government used the refusal of the Western Nations as a war-cry calling upon the Russian people to prepare for a war with Europe, because Russia is to be attacked.

The fact is that the gang of Ashkenazim (or Tartar) Jews which now runs the Government of the Union of Socialist Soviet Republics is in exactly the same position as was the French Revolutionary Government of about 1795. It is thoroughly hated by the people because of its tyranny. And so it can only hold itself in power by raising the cry "The Country is in Danger." Anything hostile to the Government is thus held up as treason to the Nation.

All these developments are of quite recent date and follow quite naturally on everything which has been published in The Aeroplane for the past five years on the subject of Russia's preparation for war. Who the Russian Napoleon is to be has not yet been disclosed. Probably even now he is quite a junior officer.

The Need for a Leader.

Considering the Russian Revolution in parallel with the French Revolution, which it has followed step by step, we are now just about at the stage of the *Directoire*. The banishment of Trotsky and his gang and the rise to power of the Stalin faction corresponds fairly exactly to the famous *Thermidor* crisis in Paris.

That was when Napoleon Bonaparte had his first chance of distinction. And for some time afterwards Bonaparte was only a very young General commanding a comparatively small French Army which pushed an utterly ineffective Austrian Army out of Italy. Consequently there is still plenty of time for the Russian Napoleon to disclose himself, even though the war in which he is ultimately to make his name may be on the point of beginning.

The Red Army.

So far as the Red Army is concerned we know that it is the largest and most fiercely disciplined army in the World. Also it is composed of men who have the endurance and obedience of oxen.

We shall do well to remember that the active work of the Russian Revolution (the political string-pulling and the appalling atrocities) was done by a minute minority of the population of Russia, and that the great mass of the people remain, as they have always been, fatalistic, stupidly brave, and ready to obey any great leader. Before the Revolution they regarded the Great White Tzar as their Little Father. Afterwards they revered Lenin, with Trotsky as a kind of second string. And they will be just as willing to make the Russian Napoleon the object of their hero-worship.

Several years ago in this paper one quoted the statement of an Englishman who had just been to Russia to the effect that the Red Army had one very simple objective in view, namely, to march to Paris,—because there is a greater supply of wine and women there than anywhere else. The Red officers remarked that the Russians had walked to Paris in 1814 and that there was no reason why they should not do it again. They are fairly well right, for if they started now they would find practically no opposition between them and Vienna.

Russian staff work is supposed to be bad. At any rate it was very bad in 1914-17. But the Japhetic tribes which turned out leaders like Attila, Timor, Jenghiz (which is another variation of the word Chang, or elephant), his son Ogdai, and his great general Sabutai, can certainly after this lapse of a few hundred years produce others who are equally fine strategists and organisers of staff work.

Red Aircraft.

The Red Army's aircraft are not particularly up-to-date. One gathers that they consist chiefly of imitations of the D.H.9a, and that the Russians have bought thousands of Liberty engines from the United States. Though Russian designers have certainly built quite interesting machines of their own design, including all-metal types,—some of which have put up quite good cross-country performances, —they have no big supply of modern machines. But we must remember that, except for the Polish Air Force, which, though well trained is small in number, there is no air force at all between Moscow and the French frontier.

Here we must also remember that the Red Air Force and the Chemical Warfare Department are interconnected and that presumably the intention is to use masses of aircraft in gas warfare against the cities of Western Europe. Without wishing to be in any way an alarmist, like those who talk about London being gassed out of existence in twenty-four hours, the fact remains that Russia has produced a very high proportion of clever chemists, and that obsolete aircraft with up-to-date chemical equipment may be quite effective against people who have no aircraft at all.

Also we have been told that the Russian Army is very weak on the mechanical side, including not only big guns but such as tanks, dragons, S.-P. Gs., tankettes, armoured cars and all these other clockwork contrivances in which the Western Armies seem to put their trust. But that also seems to matter

ON THE ZAMBESI.—The launch of the Aircraft Operating Co.'s D.H.9 seaplane (Nimbus engine) at Livingstone after being converted from a landplane by the fitting of a pair of Short metal floats.

World's Records *for* Great Britain with NAPIER engine

Captain H. S. Broad, flying a de Havilland "Hound" aeroplane, fitted with 550 H.P. Napier aero engine (Series XI), on Friday, April 27th, 1928, set up three new World's air speed records for Great Britain, as follows :—

1. *Fastest speed over 100 kilometres (62.14 miles) whilst carrying a load of 1000 kilograms (2210 lbs.)*
   —162.292 m.p.h.
2. *Fastest speed over 500 kilometres (310.7 miles) whilst carrying a load of 1000 kilograms (2210 lbs.)*
   —158.663 m.p.h.
3. *Fastest speed over 500 kilometres (310.7 miles) whilst carrying a load of 500 kilograms (1105 lbs.)*
   —158.663 m.p.h.

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comparatively little against nations which have practically no mechanical equipment at all.

When one considers the position of Central Europe one sees that there is nothing between Moscow and Vienna which is capable of standing up to the sheer weight and mass of the Red Army as it is to-day.

THE CENTRAL BARRIER.

The barrier between civilised Europe and the Yellow people of Russia is that little block of tribes which were once included in the German Empire and the Austro-Hungarian Empire, and have self-determined themselves as independent nations since 1918.

They have been chiefly armed and equipped by the French, who have done it on a simple and ingenious plan. They have lent to the small nations the money which France owes us and the United States for saving France in 1914-18. This money has been lent to the small nations on the condition that it is spent with French manufacturers of guns, aircraft and other Army equipment. And so the whole thing is done by taking our money out of one of France's pockets and putting it into the other.

Directly on the Russian Frontier lie Poland and Rumania. To the West of them are Czecho-Slovakia, Hungary and Yugo-Slavia.

There is continual enmity between Hungary and her neighbours,—to the North the Czecho-Slovaks, to the South the Yugo-Slavs. Moreover, basically, the Hungarians are square-heads, of the Japhetic tribe of Ripath, and so have strong racial antipathies to the long-headed Slavs of Poland and Czecho-Slovakia (Bohemia) and Yugo-Slavia (Serbia).

Thus Hungary forms a corridor almost to Vienna, and separated from Russia only by Rumania. Therefore the weak spot in the line of defence is obviously Rumania, which, as every reader of the daily papers knows, is at present in a state of semi-revolution. Apart from the fact that the Rumanians are not naturally a war-like people, the worst weakness of the Kingdom of Rumania is its size.

GREATER AND WEAKER RUMANIA.

In 1917 when Russia collapsed and let us down, Rumania was over-run by Austrian troops and gave up the fight, being left with the bulk of her Army and country almost undamaged. When in 1918 the Austrian, Hungarian and Bulgarian Armies collapsed, one of the Bratianu factions who had been waiting at Salonika was flown across hostile Bulgaria by Lieut. Louis Noel, of the French Aviation Service, and was landed near Jassy,—which was then the acting capital. This politician gathered together the Bratianu party, remobilised the Rumanian Army and proceeded to grab territory all round Rumania on the strength of the claim that the population of those territories was largely Rumanian.

Russia still being in a state of revolutionary chaos, the Rumanians seized Bessarabia. Bulgaria being in a state of collapse, Rumania seized the Dobrudja. And Hungary being in the throes of self-destruction, Rumania seized Transylvania, right away on the Western side of the Carpathians.

The result has been that Rumania's population has been doubled or trebled, but the increase in the population has consisted largely of Russians, Bulgars and Hungarians, all of whom are square-heads and bitterly hostile to the Rumanians, who are a long-headed mixture of Slav and Roman.

RUSSIA'S OPPORTUNITY.

If the Soviet Government judge that the time is now ripe, and it could not well look riper, the first move will be for Russia to capture Bessarabia. Nothing could be easier. And no excuse is needed for doing it.

Whatever opposition Rumania puts up is bound to be followed by a Russian advance into Rumania proper. That must at once mean that Bulgaria will take posession of the Dobrudja and that the Hungarians in Transylvania will do their best to bring that territory back into the Kingdom of Hungary.

As there is no Hungarian Army, the Russians will have good excuse for continuing their Western way over the Carpathians on the pretence of abolishing the Rumanian rule in Transylvania. And after that they will have at least as clear a road to Vienna as had Sabutai.

WHAT NEXT?

What would happen then would be interesting to watch. The Yugo-Slavs might conceivably attack the left flank of the Red Army, but probably by that time the Bulgarians, armed by Russia, would have attacked the Serbs. Probably Poland and Czecho-Slovakia would be too anxious about guarding their Southern frontiers to make any direct attack on the Red Army.

Probably before the Red Army reached Vienna the League of Nations at Geneva would have made up its mind whether this was a case for calling upon all its members to stop a War of Aggression. There could be little doubt about the answer to such a question.

If Vienna were captured the Red Army's road throug Austria to Germany would be open. Western Europe's onl hope would be for the French and Italians to attack the Re Army from the South of the Alps and for the British Army Expeditionary Force and the whole of our Air Force to g to Germany and protect the Austro-German frontier unt such time as Germany could organise and equip (with ou help) such an army as would eventually squeeze the Re Army to death up against the Alps, between the Nord Allies and their Mediterranean friends. But it would be big job even then.

THE PACIFIC WAR.

On the other side of the World, in the Far East, affai are also making towards the Great World War. Japan sending a very healthy-looking army into the Chinese Pr vince of Shantung. Writers in the daily newspapers hav already pointed out that Japan's immediate ambition is dominate Chinese affairs and to acquire China's territory an outlet for Japan's surplus population.

Chinese outrages on Japanese subjects are good enoug grounds for the capture of Chinese territory. Alleged ou rages of much milder kinds were Japan's excuse for captu ing and holding the ancient kingdom of Korea.

Japan's acquisition of territory in China, with a correspon ing stranglehold on Chinese trade and the development China's minerals and so forth, might easily develop into cause of dispute between the Japanese and the American Already there have been plenty of rumours of conflicts b tween American interests in the Far East and the Japanes and this latest move is quite likely to set light to the w in the Pacific.

Quite possibly the Russian advance through Europe ma go quite a long way before the row in the Far East ev begins. The Russians might well be allowed to plod alo through Rumania and Hungary, with flank fighting with t Poles and Czecho-Slovaks and Jugo-Slavs, for a couple years before the League of Nations made up its mind become a League of Western Europe and to take to serio war. The Japanese are not likely to become seriously aggre sive until they are quite sure that England and the oth Western nations have their hands so full in Europe that th are not likely to be able to spare forces for the Far Eas

When the Japanese think that the right time has com their obvious line of action will be to strike at America capturing the Philippine Islands. And after that, so as secure a supply of oil for their Fleet and Air Force, th are almost bound to make an effort to capture the Dutch Islands.

At this point England will be bound to intervene to pr tect British trade in the Far East. And then Singapore w become the great base from which our own Naval and A Force will form a protective cordon from Singapore to Au tralia.

Also, as the United States have no base within reach Japan, we shall almost certainly ally ourselves with t States. In consequence the American Navy and Air Cor will work from our base at Singapore and from bases in t Dutch Oil Islands, first of all for the recapture of the Phil pines and thereafter for direct attack on Japan. This pa ticular phase of operations was discussed in THE AEROPLA some years ago.

That being the general position, we may now proceed discuss the relations of such wars to the lessons which learned from our mistakes in 1914-18, and to consider t further mistakes into which those lessons are likely to le us.—C. G. G.

(To be continued.)

AVIATION FOR THE MILLION.

It has come at last! A concern known as Natio Aviation Training, of 510, Detwiler Building, Los Angel Cal., offers to coach anyone to become a pilot, instruct designer or builder of aircraft in 30 easy lessons in the co fort of their own home.

On completing the course and taking an examinati thereon, the above-mentioned institution grants a diplo of proficiency.

One presumes that after acquiring the diploma all c has to do to become a complete aviator is to take a cou of practical flying by seeing "Wings" at the local kinen and then buy a stick-pin of an airplane to put in on neck-tie.

AIR EXPLORATION IN BRITISH NEW GUINEA.

The Smithsonian Institute is sending an expedition ir British New Guinea on sugar cane research. The expediti includes a Fairchild monoplane seaplane (Wright Whirlwi engine), which will be piloted by Mr. Richard K. Peck, Elgin, Ill.

FAIREY

AIRCRAFT

HONOUR TO MR. A. V. ROE.

On Friday, June 8, the Committees of the Royal Aeronautical Society, the Royal Aero Club, the Air League of the British Empire and the Society of British Aircraft Constructors, propose giving a banquet to Mr. A. V. Roe, the date being as nearly as can be ascertained the Twenty-first Anniversary of the first aeroplane flight in Great Britain, which was made by Mr. A. V. Roe on the Motor Track at Brooklands.

There has always been some little doubt as to whether Mr. A. V. Roe's flight actually antedated the first flight made at Aldershot by Mr. S. F. Cody, then an American subject. The argument is not so much on the question of date as on what actually constituted the first flight. Both these aviators had been running their machines about on the ground for some considerable time before, and the difficulty was to decide what made a hop into a flight.

At any rate, there is no doubt that Mr. A. V. Roe was the first British aviator, for even as late as the Blackpool Flying Meeting in 1909 he was the only British competitor who got off the ground on a British machine. And he had been experimenting continually from his first efforts at Brooklands in 1907.

He had definitely made straight flights on a tractor triplane with a Jap motor-cycle engine on Lee Marshes in 1908, and he had also made straight flights on a similar machine at the old Exhibition Grounds at Wembley early in 1909.

For these reasons alone Mr. A. V. Roe is entitled to be honoured as the first British aviator.

On such an occasion as this mention should also be made of those who helped in the early efforts of our pioneer of flying, for pioneers are seldom in the happy position of being able to finance their own experiments. Mr. A. V. Roe's first supporter was his father, the late Dr. Roe, of Putney. In 1908 Lieut. F. L. M. Boothby, R.N., later to be famous as an ardent advocate of airships, took a practical interest in his work. At the same period Mr. Prestwich, of the Jap engine, also assisted. And, at intervals, Mr. A. V. Roe's brother, Mr. H. V. Roe, also helped in those early years.

In 1909 Mr. H. V. Roe, who had retired from the Manchester Regt. after serving in South Africa, was the proprietor of a very successful webbing business in Manchester, known as H. W. Everard and Co. He went into partnership with Mr. A. V. Roe, the firm of A. V. Roe and Co. Ltd. coming into existence officially on Jan. 1, 1910. And, as Everard and Co. were the proprietors of that well-known commodity, there was a current jest that Avro biplanes were kept up by Bulls-Eye Braces.

From that date Mr. H. V. Roe was responsible for the finance, organisation and management of A. V. Roe and Co., and financed the business until the end of 1912, when the late Mr. James Groves, of Manchester—the father of the late Air Commodore R. M. Groves—came into the business and increased the capital very considerably. Mr. H. V. Roe still remained in sole control of the business end of the firm, with such success that for 1913 A. V. Roe and Co. Ltd. paid its full 10 per cent. on its Preference Shares.

In 1914 the famous 504 type Avro was produced. This was afterwards developed into the 504K, and is to-day, with modifications, the standard training machine of the Royal Air Force and of many foreign nations. That the Avro was not merely a training machine in the early days of the War is shown by the fact that three Avros were used on the successful raid on the Zeppelin Works at Friedrichshafen in November, 1914.

Mr. H. V. Roe remained in charge of the business until July, 1917, when he joined the R.F.C. He was too old then to be a pilot, but he flew as an observer, and was badly crashed in an F.E. when night-flying in the Vosges in 1918, with the Independent Force, R.A.F.

Mr. John Lord, who joined Mr. H. V. Roe in Everard and Co. about 1906, and shortly afterwards became manager, became a partner in Everard and Co. in 1913 and became a director of A. V. Roe and Co. Ltd. when Mr. H. V. Roe joined the R.F.C. To Mr. Lord must be given full credit for having kept the Avro business on its feet through the slump which smote the Aircraft Industry after the Armistice. Mr. Lord's personal popularity with the Air Ministry and his business acumen in recognising the types of machines on which the firm's work should be concentrated has contributed largely to the success which was shown by a recent statement to the effect that profits on Avro shares held by Crossley Motors Ltd. contributed largely to that firm's well-being.

Of Mr. A. V. Roe's other early associates mention must certainly be made of Mr. R. J. Parrott, who joined Mr. Roe in his very early days at Wembley, after serving his time as an engineer. Mr. Parrott is now Works Manager at Hamble, and to his high ideals of workmanship must be largely attributed the confidence which everybody has in Avro products.

Yet another of the earliest of the Avro team is Mr. Ro Chadwick, whom one personally remembers as quite a bo at Brooklands when the aerodrome was made there. H has now for many years been the firm's chief designer, an to him must be given the credit for the fact that from th firm's biggest multi-engined machines right down to th little Avian, all Avros have had pleasing lines and hig performances—demonstrating the axiom that if a thing i right it *looks* right.

Finally one must mention Mr. R. H. Dobson, th Manager of the firm's Manchester Works. Though h actually came into the firm later than the other member already mentioned, he was still very early, as air histor goes, and he has very decidedly made his mark in th Aircraft Industry. His organising ability and his way c handling men account for the fact that the Mancheste Works, where the production machines are turned out, ar such a profitable concern.

One hopes most sincerely that everybody who can possibly do so will attend the banquet on June 8 as a mark c respect to a man who is not only our first aviator but on on whose early work the high reputation of British aircraf throughout the World is so largely based.

H.R.H. the Duke of York has graciously consented t honour the gathering with his presence after the banque which will be followed by a dance.

The banquet will take place at the Savoy Hotel at 19.3 for 20.0. hours on Friday, June 8, 1928. Tickets, £1 1s each, exclusive of wines. Members may be accompanie by ladies. Application for tickets should be made to th Secretary, Royal Aeronautical Society, 7, Albemarle Stree W.1.—C. G. G.

LONDON—CAPE TOWN—LONDON.

On May 12 Lieut. R. R. Bentley, A.F.C., S.A.A.F., accompanied by his wife, arrived at Croydon aerodrome on hi D.H. Moth (A.D.C. Cirrus II engine) after having flown fron South Africa, and he is thus the first pilot to make th flight from London to Cape Town and back in a light aeroplane, besides being the first to do the journey in eithe direction with a passenger in a light aeroplane.

Lieut. Bentley left Stag Lane aerodrome on Sept. 1 on hi D.H. Moth G-EBSO, "Dorys," which was then rigged a a single-seater and he arrived at Cape Town on Sept. 28 For this flight he was awarded the 1927 Britannia Trophy which is presented annually by the Royal Aero Club t the British pilot, who, in the opinion of a committee. ha made the most meritorious performance of the year.

Soon after his arrival in South Africa Lieut. Bentle married Miss Dorys Oldfield and as a honeymoon he decide

THE DOUBLE EVENT.—Mr. and Mrs. Bentley after arriving at Croydon.

Blackburn
IRIS

"THE THREE-ENGINED BLACKBURN 'IRIS' with metal hull is one of the recent successful types of flying boat. A small production order has been placed for this type and it is believed that one of the new flying-boat flights referred to by Sir Samuel Hoare will be equipped with 'Iris' flying boats."

"THE NAVY," APRIL, 1928.

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to make a return flight to England, carrying his wife as passenger.

From Mongalla to Khartum he acted as escort to Lady Heath who was making a solo flight from Cape Town to England on an Avro Avian (A.D.C. Cirrus engine).

On his arrival at Khartum he turned back to escort the Hon. Lady Bailey, who was making a solo flight from London to Cape Town on a D.H. Moth (A.D.C. Cirrus engine) as far as Mongalla, when permission for her to fly single-handed over a dangerous area of the Southern Sudan had been refused by the Sudan Government unless she had an escort.

On his arrival at Tunis he again caught up with Lady Heath, who was held up there pending the arrival of an escort of the Italian *Regia Aeronautica,* which was to convoy her over the Mediterranean.

Mr. Bentley's arrival at Croydon was a very quiet affair, and after complying with the usual formalities he left for Stag Lane aerodrome, where his arrival caused even greater surprise than that evinced at Croydon.—L. B.

RECENT FATAL ACCIDENTS.

Somewhat naturally the three fatal accidents in aeroplanes which occurred within the week ending May 12 have given the daily newspapers cause for something like one of their old outbreaks on the danger of flying. This is not likely to do much harm among those who are already keenly interested in aviation as prospective pilots. But it may cause extra anxiety to parents of pilots, prospective or otherwise.

Therefore one would ask readers of this paper to take due note of the fact, and to spread the information as much as is in their power, that so far as can be gathered from evidence at all the inquests each of those accidents was caused by a plain stall followed by a dive and/or spin,—and that none of those machines was fitted with slot control.

Nobody, least of all those who are financially interested in the slot control, is going to pretend that slot control will put an end to accidents with machines which are stalled close to the ground, or in the act of landing or getting off. But it does definitely stop nose-diving and/or spinning, with the result that though a machine may hit the ground hard and break itself, as has happened twice with slotted machines which were being demonstrated by skilful pilots, it will assuredly reduce very considerably the number of fatal accidents.

The probability is that none of the accidents of the past week would have been fatal if the machine had been fitted with slots. And quite possibly none of them might have been accidents at all, in that the machines might have either made a safe landing or might have gone on flying without landing at all.

An interesting point about the way in which the slot control is regarded by those best entitled to judge is that though the insurance premium on machines fitted with slots is not reduced for the machines themselves, the premium is reduced for the pilots of slotted machines.—C. G. G.

A MARK OF GRATITUDE.

The following paragraph from the Esthonian journal *Revaler Boten* is of interest :—

> In consideration of the services he has rendered to Aviation, the Government of Esthonia has decided to grant to the English aviator, Major Claude Scudamore Emery, a yearly pension of 1,200 crowns for life. The necessary Government Bill has been submitted to the Council of State. Major Emery has lost sixty per cent. of his ability to work as a result of his strenuous work in the service of Esthonia.

Major Emery, who has lived in Esthonia since his demobilisation from the Royal Air Force, has taken a very prominent part in the development of Esthonian military aviation. On the declaration of independence of this fragment of the former Russian Empire a small air service was formed. This service absorbed a heterogeneous collection of aircraft, principally of German origin, and a number of former Russian pilots and mechanics.

Major Emery was appointed an instructor to the Esthonian Air Force, and as the result of his organising ability and the enthusiasm of the Esthonian personnel he has succeeded in building up an exceedingly efficient Air Force. Throughout he has worked hard in the interests of British Aviation. Esthonia has from the beginning shown an appreciation of British aircraft, but has been severely handicapped by the shortness of money. Nevertheless, from the very beginning it managed to acquire a number of Avro 504K, D.H.9s, Sopwith Camel landplanes, and Short seaplanes, and it was on these machines that so much of the original training work was accomplished.

Major Emery has now transferred to civil life, and he still persists in his work for British Aviation in the Baltic States. He now represents the D.H. Moth in Esthonia and Finland, and in the latter country he was largely responsible for the placing of the licence for the construction of the Moth in that country.

It is exceedingly gratifying to note that his services should have been recognised by Esthonia.—L. B.

THE ANGLO-PERSIAN AGREEMENT.

In the House of Commons on May 14, in reply to a question by LT.-CMDR. KENWORTHY, the SECRETARY OF STATE FOR FOREIGN AFFAIRS made the following statement :—

" A Treaty regulating the commercial relations between this country and Persia was signed at Tehran on May 10 by His Majesty's Ministers on behalf of Great Britain and Northern Ireland and all other parts of the British Empire which are not members of the League of Nations, and of India.

" The Treaty, which has been concluded for a period of eight years, provides for the abrogation of all provisions of existing Treaties which limit in any way the right of Persia to settle her Customs tariff autonomously. It provides that, on condition of perfect reciprocity, British and Indian goods imported into Persia shall not be subject to higher duties than are the goods of any other foreign country."

Continuing he said :—

" As regards facilities in Persian territory for the proposed air service between Egypt and India, the Persian Government have formally stated their readiness to enter into negotiations with a representative of Imperial Airways Limited, regarding the conditions on which such a service should be operated.

" With regard to the abolition of the capitulations in Persia on May 10, the Persian Government have addressed to His Majesty's Minister a list of the safeguards which they are prepared to extend to British nationals in Persia; and steps are being taken to bring these safeguards to the knowledge of the British nationals concerned. These safeguards are in complete accordance with the relevant provisions of Persian law as recently amended.

" Finally, the Persian Government have agreed formally that missionary enterprises in Persia shall be authorised to carry on their charitable and educational work on condition of not contravening either public order or Persian laws and regulations.

" In conclusion, I am happy to take this opportunity of expressing the satisfaction of His Majesty's Government at the energetic collaboration which the Persian Minister of the Court has shown in reaching this comprehensive agreement with Sir Robert Clive, of whose efforts I have already expressed my appreciation."

AUSTRALIA'S ADVANTAGE.

Mr. W. S. Shackleton, who until recently was chief designer for William Beardmore and Co. Ltd., of Dalmiur, has recently joined the staff of the Larkin Aircraft Supply Co. Ltd., Melbourne Aerodrome, Melbourne, Victoria, and is now in charge of their works there. Mr. Shackleton first made his name as the designer of the A.N.E.C. monoplane, which shared with the English Electric Company's Wren *The Daily Mail* £1,500 Prize at Lympne in 1923. Thereafter he joined the staff of the Beardmore firm and produced the Wee Bee, which was also one of the most successful light aeroplanes of its day, and won *The Daily Mail* Prize at Lympne in 1924.

Following that he designed for the Latvian Government a two-seat fighter which was in many ways one of the best military machines of its period. His next work was the modification of Dr. Rohrbach's designs to Air Ministry requirements, which, coupled with the practical knowledge of Sq. Ldr. de Haga Haig, resulted in the Beardmore Inflexible, which has of late been doing some very interesting experimental flying at Martlesham.

While engaged on this last work Mr. Shackleton was taken seriously ill and endured a lengthy recovery from a grave operation. The climate of Glasgow not being conducive to his complete recovery he went to Australia, and was fortunate in immediately joining forces with the Larkin Co.

His outstanding ability as a designer and his experience of the construction of big and small machines both here and on the Continent, both in Austria and France, coupled with Mr. Larkin's push-and-go methods, should do much to advance the construction of aircraft in Australia. Unlike motor-cars, in which the bulk of the car has to be imported and only the bodies built in Australia, aeroplanes can be built practically throughout of Australian material and only the engines, instruments and some few other fittings need be imported. So there seems to be in the Larkin-Shackleton combination great possibilities for the development of aircraft production in Australia.—C. G. G.

THE ITALIAN POLAR EXPEDITION.

On May 11 Gen. Nobile left King's Bay on the airship *Italia* in the hope of reaching and exploring Nicholas II Land, which is some 900 miles from King's Bay, off the coast of Siberia.

Some two hours after leaving King's Bay the *Italia* ran into thick fog, and was forced to turn back. On alighting at King's Bay the airship bumped to ground rather heavily, and one engine was badly damaged.

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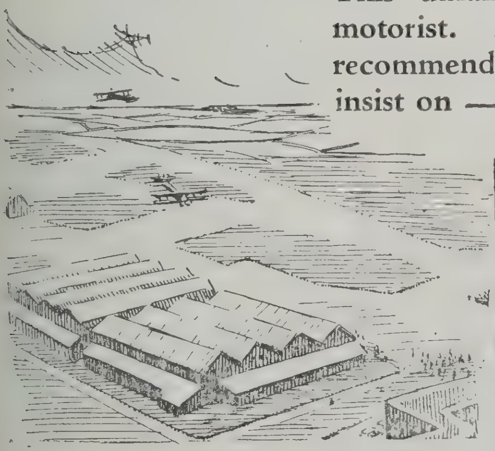

THE ROYAL AIR FORCE.

The London Gazette.

May 8.

GENERAL DUTIES BRANCH.—E. C. T. Edwards is granted a perm. comn. in the rank of Plt. Off. with effect from April 30, 1928, and with seniority of April 30, 1927. The following Plt. Offs. are promoted to the rank of Flg. Off. with effect from the dates indicated:—N. W. K. Seeman (Jan. 17), F. H. L. Searl (April 2), L. Newcombe (April 10).

The following Flg. Offs. are transferred to the Stores Branch on probation (April 28):—R. N. Hesketh, B. G. Pool.

Flt. Lt. E. O'D. Crean is placed on the retired list at his own request (May 9). The following are transferred to the Reserve, Class A:—Flg. Off. F. A. Pumphrey, D.C.M. (May 4), Plt. Off. J. C. McE. Gibb (April 19). F. H. G. Oliphant, Lt., R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on return to Naval duty (Feb. 21); the S.S. comn. of Plt. Off. on probation K. I. F. C. Norman-Wright is terminated on cessation of duty (May 9).

STORES BRANCH.—The following are granted perm. comns. as Plt. Offs. on probation with effect from and with seniority of April 28:—G. Matthews, E. N. A. Crowe-Browne, M. J. Scott, L. F. Oldridge, A. W. Rule, J. S. French, E. J. H. Starling, P. Dennehy, J. W. Hunt, P. V. Edwards, H. E. Freeston, J. E. Reynolds, F. G. Lee.

MEDICAL BRANCH.—R. E. Alderson, M.B., is granted a S.S. comn. as a Flg. Off. for three years on the Active List with effect from and with seniority of May 1, and is seconded for duty with the Victoria Infirmary, Newcastle-upon-Tyne, from that date; Flg. Off. P. O'Callaghan resigns his S.S. comn. (May 2); Flt. Lt. T. Sheehan relinquishes his temp. comn. on completion of service and is permitted to retain his rank (April 25).

RESERVE OF AIR FORCE OFFICERS.—GENERAL DUTIES BRANCH.—The following are granted comns. in Class AA (ii) as Plt. Offs. on probation:—J. M. Gittins, R. Pankhurst, M. H. Richardson, F. O. Tickell (April 23); G. H. Thevenard (April 24); G. M. Randall (April 25). Plt. Off. on probation H. Haigh is confirmed in rank (May 8). Plt. Off. G. B. Shillaker relinquishes his comn. on completion of service (May 5).

The following Flg. Offs. are transferred from Class A to Class C:—E. C. N. Jeffries (April 6); P. A. A. Boss (April 20).

AUXILIARY AIR FORCE.—MEDICAL BRANCH.—The following Flg. Off. (Hon. Flt. Lt.) to be Flt. Lt.:—NO. 600 CITY OF LONDON (BOMBING) SQUADRON.—N. P. Henderson, M.D. (April 6).

Appointments.

GENERAL DUTIES BRANCH.—Air Commodore T. C. R. Higgins, C.B., C.M.G., to No. 10 Group, H.Q., Lee-on-Solent, pending taking over command, 6/4.

Wing Commander R. B. Ward, A.F.C., to R.A.F. Depot, Uxbridge, 13/4.

Flight Lieutenants C. J. S. Dearlove, to R.A.F. Depot, Uxbridge, 23/3. H. V. Pendavis, D.S.O., to R.A.F. Depot, Uxbridge, 2/5. H. T. Lydford, A.F.C., to Fighting Area, H.Q., Uxbridge, 14/5. S. H. Ware, to R.A.F. Depot, Uxbridge, 31/3. D. D'A. A. Greig, D.F.C., to M.A.E.E., Felixstowe, 1/5.

Flying Officers F. Porter, to R.A.F. Depot, Uxbridge, 20/4. L. K. Barnes, to R.A.F. Base, Calshot, 8/5.

MEDICAL BRANCH.—Flight Lieutenant G. P. O'Connell, M.B., to R.A.F. Depot, Uxbridge, 6/4. Flight Lieutenant (Q.M. Medical) J. M. Maxwell, to R.A.F. Depot, Uxbridge, 31/3 Flight Lieutenant (Dental) P. P. Hogan, to H.Q., Middle East, 30/3.

STORES BRANCH.—Flying Officers R. N. Hesketh and B. G. Pool, to H.Q., Cranwell, 28/4.

Pilot Officers G. Matthews, E. N. A. Crowe-Browne, M. J. Scott, L. F. Oldridge, A. W. Rule, J. S. French, E. J. H. Starling, P. Dennehy, J. W. Hunt, P. V. Edwards, H. E. Freeston, J. E. Reynolds and F. G. Lee, to H.Q., Cranwell, on appointment to Perm. Comns. (on probation), 28/4.

ACCOUNTANT BRANCH.—Flight Lieutenant R. H. Cleverly, to R.A.F. Station, Hendon, 8/5.

Flying Officer H. Crowther, to No. 504 Sqdn., Hucknall, 21/5.

CHAPLAINS BRANCH.—The Rev. R. M. Bankes-Jones, to R.A.F. Depot, Uxbridge, 31/3.

The Far East Flight.

The four metal Supermarine Southampton flying-boats of the Far East Flight, which is under the command of Group Capt. H. M. Cave-Browne-Cave, D.S.O., D.F.C., are being overhauled at the Seletar Base, Singapore, and will leave for the Dutch East Indies and Australia about May 21.

The Service Flight to North Africa.

Wing Cdr. J. R. W. Smyth-Pigott, D.S.O., Air Attaché to the British Embassy in Paris, who is visiting French air bases in North Africa, in a Service D.H. Moth, had a forced landing at Affreville on May 9 and damaged the machine to such an extent that he was unable to continue his journey.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Invergordon to a Southampton flying-boat of No. 480 (Coastal Reconnaissance) Flight, Calshot, on May 10, 347098 Cpl. Ernest Bradford, a passenger, was killed, and Flt. Lt. Alick Charles Stevens, the pilot of the aircraft, sustained minor injuries. The two other occupants of the aircraft were uninjured.

The Air Ministry regrets to announce that as the result of an accident at Old Sarum, Wiltshire, to a Bristol Fighter machine of No. 16 (Army Co-operation) Squadron, Old Sarum, on May 11, Flg. Off. Gerald Arthur Underdown, the pilot of the aircraft and 370390, L.A.C. Donald Martin Thomas, were killed.

At the inquest at Salisbury on May 12, Flg. Off. Schofield said that he saw the machine dive from about 400 ft. down to 50 ft. or 100 ft. This was in accordance with instructions, and was done to give Army officers practice in shooting at low-flying aircraft with camera guns. The pilot made two dives with perfect success, making a steep turn after each. He made a third dive from about 150 ft., took a steep stall turn to the right, and the engine was throttled back. The turn was completed normally, but owing to the low altitude the aeroplane struck the ground before it had recovered. The pilot must have imagined he had more height than was the case, and the accident arose through the error of judgment.

A verdict of Accidental Death was returned.

The Air Ministry regrets to announce that as the result of an accident at Farnborough, Hants, to a Fairey 3.F machine of No. 446 (Fleet Spotter Reconnaissance) Flight, H.M.S. *Courageous*, on May 12, 363057 AC.1 John George Bolton, R.A.F., was killed, and J.70337 Telegraphist Percival Reginald Carter, R.N., sustained injuries from which he died in hospital on the same day. Capt. Edward James Osborne Ellison, R.M., Flg. Off. R.A.F., the pilot of the aircraft, was seriously injured.

DESERT SAND.—A D.H.9a of No. 8 (Bombing) Squadron being prepared to face an approaching sand-storm at Samawah, 'Iraq, during the operations there in March, 1925. The machine has been picketed down with three full five-gallon drums to each wing-tip skid, two full five-gallon drums in the empennage in front of the fin and with a man lying on each wing. The aircraft remained intact. During the storm the air-speed indicator on one machine registered 50 m.p.h.

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The Imperial Defence College.

Major-General W. H. Bartholomew, C.B., C.M.G., D.S.O., has been appointed Commandant of the Imperial Defence College, in succession to Vice-Admiral Sir H. W. Richmond, K.C.B. The appointment will take effect in January, 1929

Under the present system General Bartholomew will be succeeded in January, 1931, by a senior officer of tthe R.A.F.

The Imperial Defence College was opened in January, 1927, and the R.A.F. Instructor is Group Capt. P. B. Joubert de la Ferté, C.M.G., D.S.O. Each annual course includes four R.A.F. officers.

Spanish Awards.

The Spanish Government has awarded the following decorations in recognition of the rescue of Capt. Estevez and his mechanic in the desert near Amman in 1926 by the R.A.F. :—

Grand Cross of the Order of Military Merit :—Air Vice-Marshal Sir Oliver Swann.

Cross of the First Class of the Order of Military Merit :—Flt. Lt. H. E. P. Wigglesworth, Flg. Off. J. S. L. Adams, Flg. Off. C. K. J. Coggle, Flt. Lt. D. L. Blackford, and Mr. A. L. Kirkbride (Assistant to Chief Representative in Trans-Jordan).

Silver Cross of Military Merit :—349201 Corporal G. W. Grayson and L-AC. R. Duff (ex-R.A.F.).

Flg. Off. A. M. Glover was presented with the Spanish Air Medal personally by the King of Spain at the R.A.F. Display in 1926.

All-Metal Aircraft in the R.A.F.

A question in the House of Commons on May 9 extracted from the Secretary of State for Air the information that the following six types of all-metal aircraft would be definitely available for the use of the R.A.F. by the end of this year :—Siskin, Fairey III.F, Wapiti, Atlas, Sidestrand and Virginia. He added that four other types might possibly be available but the details had not yet been settled. The general policy of the Air Ministry was to push on with the development of all-metal machines.

Replying to a supplementary question, Sir Samuel Hoare said that, generally speaking, machines were being fitted with the slotted wing device. There might possibly be exceptions.

The R.A.F. Packing Depot.

Replying to a question in the House of Commons on May 7 the Secretary of State for Air disclosed the fact that the Packing Depot at Ascot is being transferred to Sealand. He explained that the buildings at Ascot were of wartime construction and unsatisfactory for permanent occupation and that Sealand was better situated geographically and also had an aerodrome. There was no aerodrome at Ascot.

Air Commodore T. C. R. Higgins.

Air Commodore T. C. R. Higgins, C.B., C.M.G., whose appointment to command No. 10 Group, Lee-on-Solent, is dated April 6, 1928, was born in 1880 at Turvey, Bedfor shire, and educated in H.M.S. *Britannia*. He entered th Royal Navy in 1897 and retired in January, 1900. In Marc 1900, he was granted a commission in the Royal Lancashi Regiment and served in the South African War. In 1904 h was attached to the West African Frontier Force and serve in Nigeria until 1909 and again from 1911 to 1913. He wa promoted Captain in 1907 and Major in 1915. In the interv in his service in Nigeria he learned to fly on a Farman b plane at Hendon and his Royal Aero Club certificate No. is dated May 16, 1911. He was seconded to the R.F. with the rank of Flying Officer in September, 1915, and w appointed Flight Commander in October, 1915, Squadr Commander in March, 1916, and Wing Commander in Ju 1916. At the time of the formation of the R.A.F. in 1918 held the temporary rank of Brigadier-General and in Augus 1919, he was appointed to a permanent commission with t rank of Group Captain. At that time he commanded No. Group at Andover. In 1922 he was posted to the Air Minist on the Staff of the Directorate of Training, and in Apr 1926, he was appointed to Headquarters, 'Iraq Command, Chief Staff Officer.

The R.A.F. Middle East Dinner.

The Seventh Annual Middle East Dinner will be held London on Thursday, June 7, when it is hoped that a reco attendance will be attained. Time and place will announced at a later date.

It is hoped that special efforts will be made by all intereste to attend this Dinner, and that Officers will bring the no fication to the attention of all those who have left the S vice whose addresses they know.

All communications should be addressed to Brigadi General W. B. Caddell, Vickers House, Broadway, We minster, S.W.1.

Rumour.

The hardy annual rumour that the Chief of the Air Staff about to resign is once more sprouting with renewed vigo and a number of fresh branches. Chief among these is t rumour that Air Vice-Marshal Sir Edward Ellington about to hand the 'Iraq Command over to Air Vice-Marsh Sir Robert Brooke-Popham, who, in turn, will hand t Fighting Area to Air Commodore F. V. Holt.

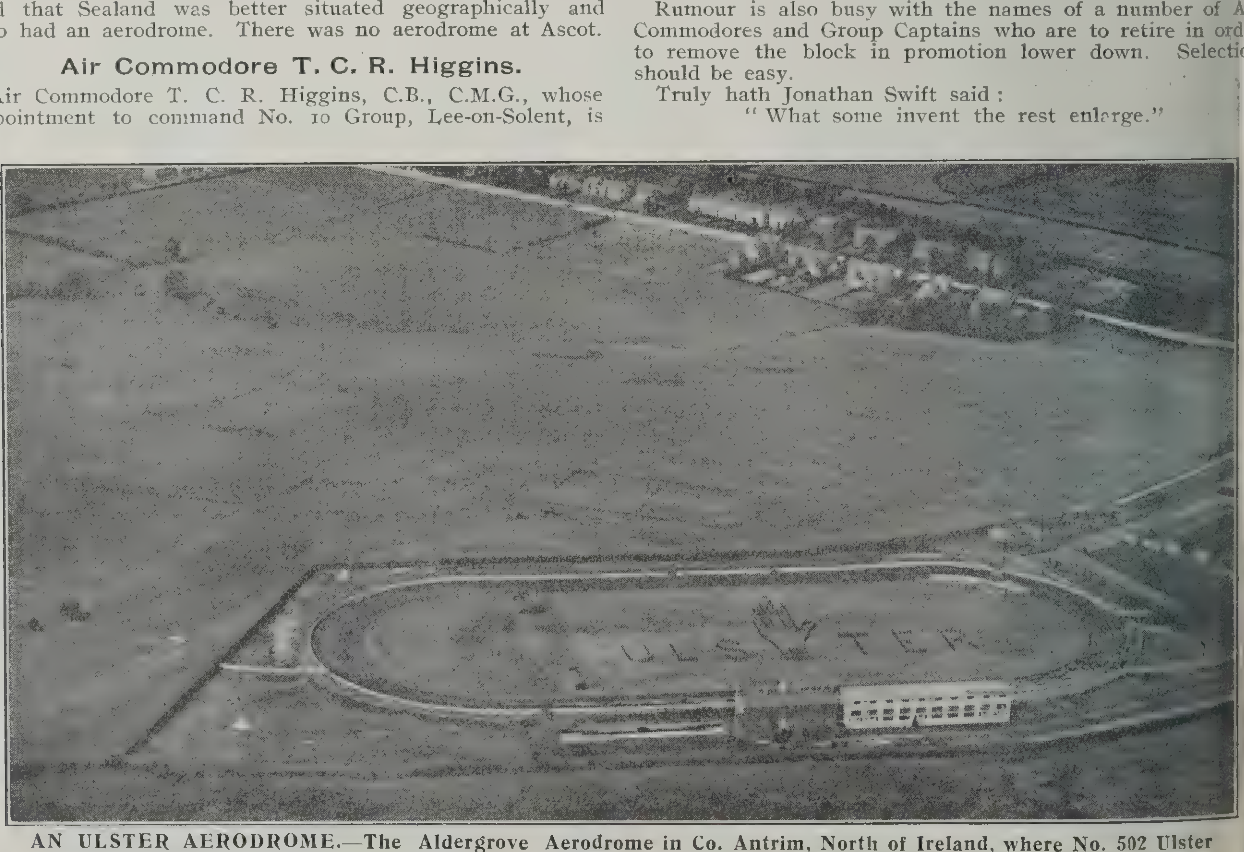
According to the rumour-mongers, Sir Edward Ellingt is to become Air Member for Personnel, while Air Vi Marshal Sir Philip Game becomes Chief of the Air Staff.

Another rumour is that Sir Philip Game will retire a that Sir Edward Ellington will in due time become C.A.S.

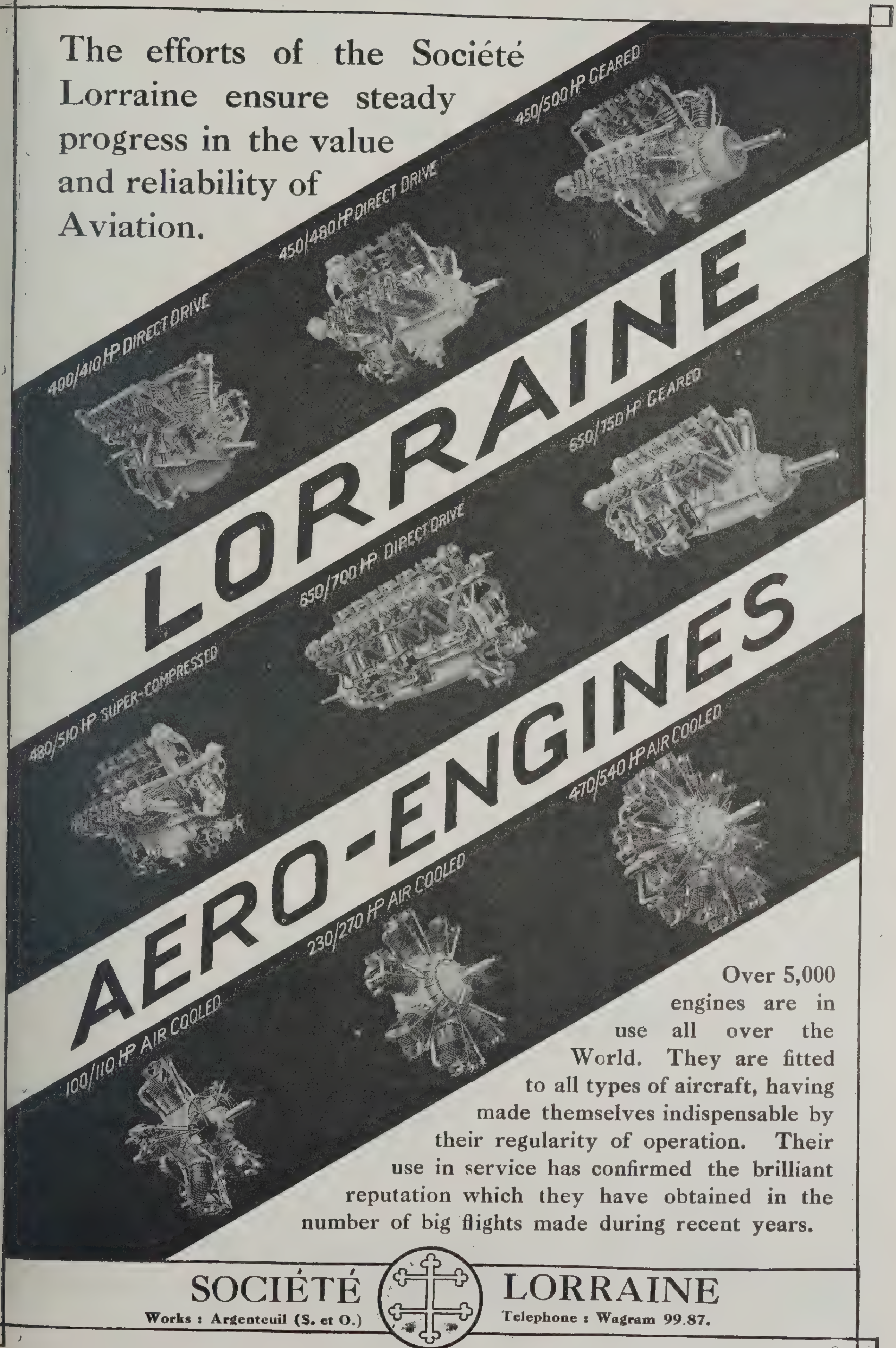
Rumour is also busy with the names of a number of A Commodores and Group Captains who are to retire in ord to remove the block in promotion lower down. Selecti should be easy.

Truly hath Jonathan Swift said :

> " What some invent the rest enlarge."



AN ULSTER AERODROME.—The Aldergrove Aerodrome in Co. Antrim, North of Ireland, where No. 502 Ulster (Bombing) Squadron, R.A.F. Special Reserve, is stationed. The Ulster Squadron is commanded by Wing Cdr. A. C. Wright, A.F.C., and is equipped with Avros and Vickers Vimys.—(*R.A.F. Official photograph.*)



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THE DESIGN AND CONSTRUCTION OF R.100.

Mr. B. N. Wallis, chief designer of the Airship Guarantee Co. Ltd., was unable to prepare his paper on The Design and Construction of Rigid Airships, which he read before the Royal Aeronautical Society on May 10, soon enough for advance copies to be printed, and as in fact he gave a running discourse on a series of lantern slides rather than read a set paper it was scarcely possible to make any adequate notes of what he did say.

In the absence of a complete report of the meeting it is only possible to record a few salient points of the lecture.

Mr. Wallis stressed the importance in the design of airships of getting the minimum of head resistance to progress through the air at the minimum of cost. Expenditure was of particular importance because this was an age of rapid development and any airship designed to-day was out-of-date before it could be completed.

Very great progress had been made recently in the art of designing airship body shapes. By means of a simple mathematical analysis of the equations for the curve of the body they had been able to avoid shapes which though they looked excellent were nevertheless of unnecessarily high resistance. In consequence they had in R.100 a shape of about half the resistance of that of R.33.

The very low resistance of some modern airship bodies had led to the belief that the whole of their resistance was due to skin friction, but tests they had made on two similar shapes, one an elongated edition of the other, suggested that this was not the case, and that there must still be some loss by eddy-making.

The position of such things as engine cars relative to the body had a great effect on resistance. The increase in resistance caused by a car when in its correct position might be three times as great as the resistance of the car alone. They had found it paid to keep all such excrescences as far aft along the body as possible. The three cars as fitted to R.100 accounted for 18% of the total resistance of the ship.

The vertical and horizontal fins and rudders accounted for 15% of the resistance. This was a larger proportion than in ships such as R.33 or R.38, partly because the total resistance of R.100 was so low. In part it was due to the fact that thick section fins had greater resistance than the thin ones used on earlier ships. In R.100 a shift of 18 ft. in the position of the fins made a difference of 8½% in drag, —or resistance.

In ten years they had halved the drag, or head resistance, of airships and there was still room for further progress. One of the things they still wanted was some way of finding out what the air did round the tail of an airship with the engines running. It seemed possible that experiments to this end could be made fairly cheaply on a pendulum of the Gnosspelius type, or perhaps in a water channel of the type developed by Prof. Melvill Jones.

A great deal of development was being done in engines and fuel. In the new Zeppelin (LZ127) a gas fuel, cracked from mineral oil, was to be used. This fuel could be produced to a density of a little less or a little more than that of air so that change in trim due to the burning of fuel did not occur.

The structural design of airships had long since ceased to be a subject for the activities of the casual inventor. It had settled down on standardised lines initiated by Count Zeppelin. But though the general lines were fixed there was room for great divergence in detail design.

In the Zeppelins the frame rings were cross-braced by wires which formed a bulkhead between adjacent gas-cells, and these wires transferred very heavy stresses to the frame structure when one gas-bag was deflated. When the design of R.100 was started he (Mr. Wallis) was very keen to use frame rings deep enough and stiff enough to do without this bracing, but finally he had to abandon the idea. The deep frames meant wasting gas-space, and therefore lift.

The usual type of gas-bag netting made the actual distribution of lift-load on the framing very uncertain. They had succeeded in developing a type of spiral mesh net in which they could keep the loss of gas-space down to a minimum by controlling the shape of the inflated bag, and could accurately determine the load distribution, and could avoid lateral loads on the longitudinal frame-members.

In regard to the type of members, they had followed lines dictated by previous experience, except in using tubes for their booms. But they could not get solid-drawn tubes of the required size, and therefore made the tubes by rolling up strips in a spiral. For this they used an extremely ingenious automatic tool designed by Chas. Churchill and Co., Ltd., which could make any size or gauge of tube they required cheaply and rapidly.*

[*Note.—This type of spiral tube is very like that used by the Premier Cycle Co. Ltd. (Hillman, Herbert, and Cooper) of Coventry about 1892.—C. G. G.]

Apart from variations in the thickness of metal every girder in R.100 was made up from only seven dissimilar components and there were only 42 dissimilar components in the whole structure. Thus they were able to order individual components in lots of half-millions, and make one airship a mass-production job.

They had suffered some anxiety at the first as to the possibility of attaining the necessary accuracy in their components. They had in fact got their main girders, 43 ft. in length, to come within limits of plus or minus .01 inch.

The lecture was illustrated by a large number of admirable lantern slides. A kinematograph film showed R.100 in process of construction. Prominence was given to the proposed passenger accommodation as it will appear when in use and inhabited. In addition a number of samples of girder work, joints, etc., were shown, including one very remarkable fuel tank, which consists of an aluminium sheet, reinforced with an internal frame work, which weighs only about 3½% to 4% of the contained fuel,—or about 1 lb. to four gallons.

The Discussion.

Sir Alan Anderson, K.B.E. (Manager of the Orient Line, Director of the L.M.S. Rly., etc., etc.), opening the discussion, said he knew nothing about airships. We had spent vast sums on their development and we now had to get them going. When they were going the dividends that could be earned would make the cost of development unimportant. He thought that Mr. Wallis was wrong in stressing the importance of cost and in not stressing the necessity for safety. Provided that safety was attained, the speed of transport possible would ensure traffic at any fares that might be necessary to charge.

Col. Richmond (of the Royal Airship Works, Cardington) said it was extraordinarily interesting to listen to one who was seeking ends similar to his own by somewhat different means. They had investigated shapes somewhat on the lines described by Mr. Wallis, but had perhaps not got so far. He agreed generally that thick fins were less efficient than thin ones, but if all the fin sections were made to Joukowski profiles the drag was low and the efficiency improved.

Major Scott said his job was to fly ships and not to discuss their design. R.100 would not be the first airship of Mr. Wallis's design he had flown and he looked forward to the experience. He agreed with Sir Alan Anderson that Mr. Wallis should have emphasised the problem of safety rather than that of cost.

Mr. J. D. North mentioned that he had recently been sent a copy of a book called "This Airship Business." He thought very highly of it, but was afraid the author had not marketed it aright. It should have been called "Gentlemen Prefer Aeroplanes" and put on the railway bookstalls in a coloured wrapper. If that book contained all that the critics had against airships there must be a very good case for them. One of the chief cases against airships was that their construction was expensive. Usually this meant only that the critic did not know how to do the construction.

Wing Cdr. T. R. Cave-Browne-Cave criticised the arrangement of two engines in each power-egg used on R.100. Each power-car should be one independent and detachable unit that could be overhauled and tested off the ship. He thought the tandem-engined car must mean low airscrew efficiency and doubted whether that low efficiency would be made up by the lowered drag of few cars.

Mr. E. F. Spanner (author of "This Airship Business") thought it was a pity that the effort of airship development was dispersed among rival establishments instead of being concentrated. He did not believe that the new airships would be safe, and he thought some competent body such as the Royal Aeronautical Society ought to investigate the safety of these ships and put a stop to the waste of money on them if they were satisfied that they would be dangerous.

Mr. C. G. Grey said that he knew nothing about airships and he did not think the Royal Aeronautical Society knew much more. Mr. Spanner's suggestion that the Society should sit in judgment on Mr. Wallis's designs was about the silliest ever heard in that room.

Mr. Wallis, replying to the discussion, said that he could refer to the reports of the Airworthiness Department as evidence of the attention given to safety in the case of R.100. This department was a most competent and thorough body, which left nothing to chance, and they had shown that the factors throughout R.100 were roughly twice those called for in the Report on Airworthiness for Airships. He could only reply to Wing Cdr. Cave-Browne-Cave by asking to be shown an ideal type of power-egg.

UN-COMMON SENSE.

It is reported that the Stinson Aircraft Corporation, of Detroit, Mich., has announced that in future it will not build any aircraft for trans-oceanic attempts.

It has returned a deposit of $3,700 to Fraulein Thea Rasche, who, when in the U.S.A. last year, ordered a Stinson Detroiter, with which she intended to attempt a west-to-east Atlantic flight this year.

THE ROYAL AERO CLUB RACING FUND.

The following donations to the Royal Aero Club's Racing Fund are reported :—

From Sir Charles Wakefield, Bart., £1,150, distributed thus—King's Cup Race £250, Aerial Derby £500, Official Meetings £400.

From the Robinhood Engineering Works Ltd., Official Meetings £100.

Other donations :—Lieut.-Col. Sir Francis K. McClean, A.F.C., £5; Capt. C. B. Wilson, M.C., £3 3s.; Mr. A. V. Roe, £1 1s.; Mr. G. Merton, M.A., M.C., £1 1s.; Mr. E. J. B. How, £1 1s.

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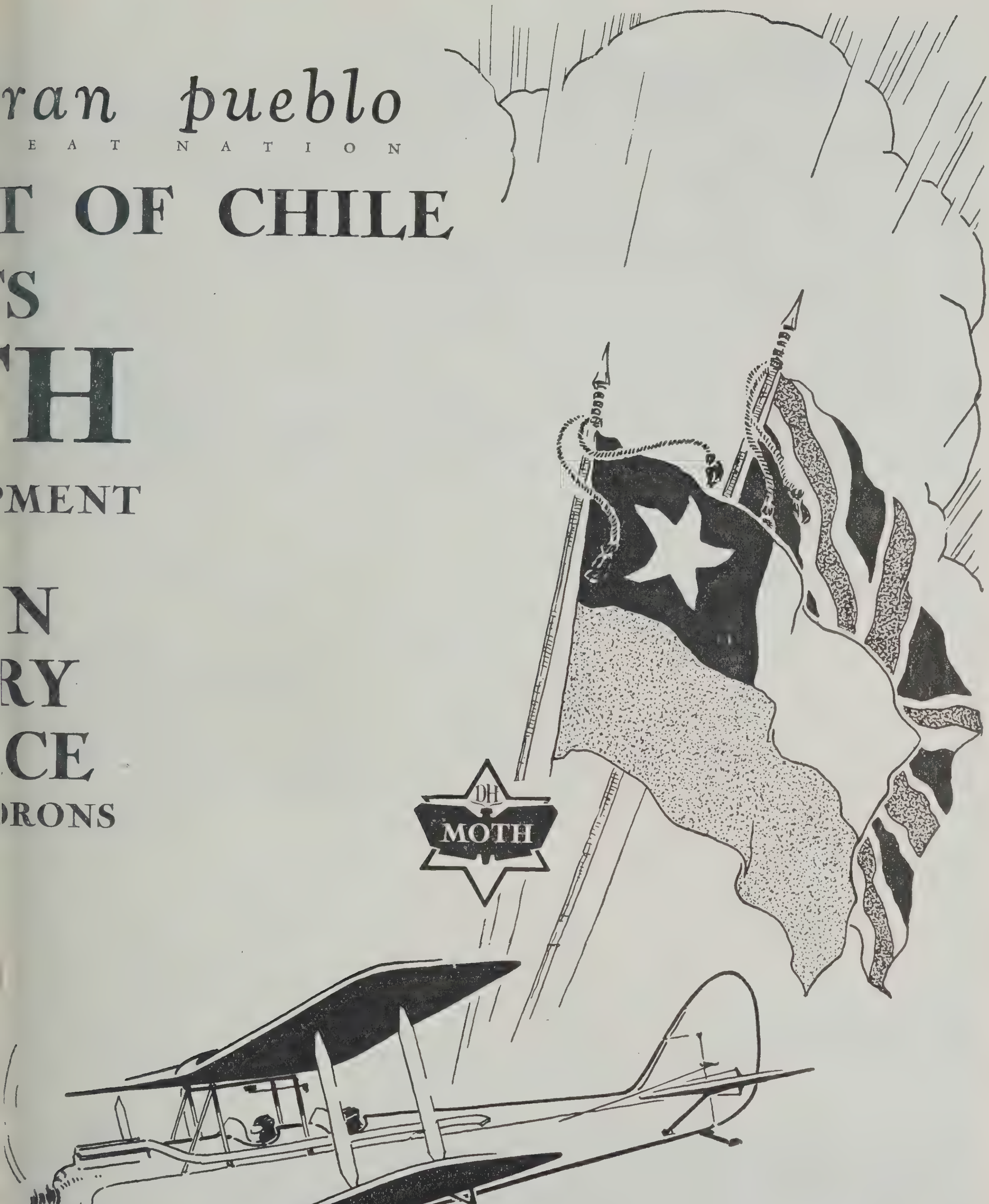

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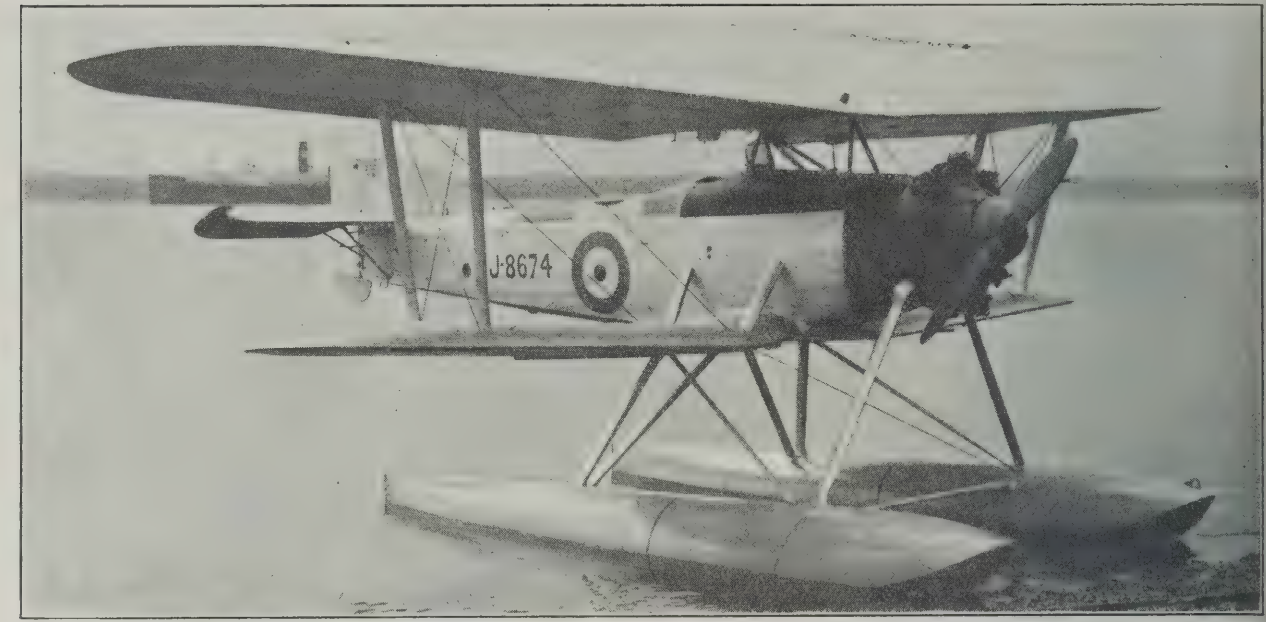
THE GLOSTER GORING SEAPLANE.



THE GLOSTER GORING.—A high-performance reconnaissance or bombing seaplane fitted with a 450 h.p. Bristol Jupiter engine. The floats are of duralumin construction.—(*"Aeroplane" photograph.*)

On May 7-8 the Gloster Goring two-seat long-distance bombing and reconnaissance biplane (450 h.p. Bristol Jupiter VI engine) was tested at Hamble as a seaplane by Mr. R. H. Stocken.

This machine was first seen at the 1927 R.A.F. Display, when it paraded among the collection of new and experimental aircraft as a landplane. It then gave a favourable impression by virtue of its very clean lines, excellent proportions and its obviously good performance, so far as could be observed in a short flight.

Since then the Goring has been under test by the R.A.F., and only recently has it been equipped with twin Gloster all-metal floats and tried out as a high-performance seaplane.

This particular model is constructed mainly of wood with steel fittings, but designs are in hand for all-metal construction.

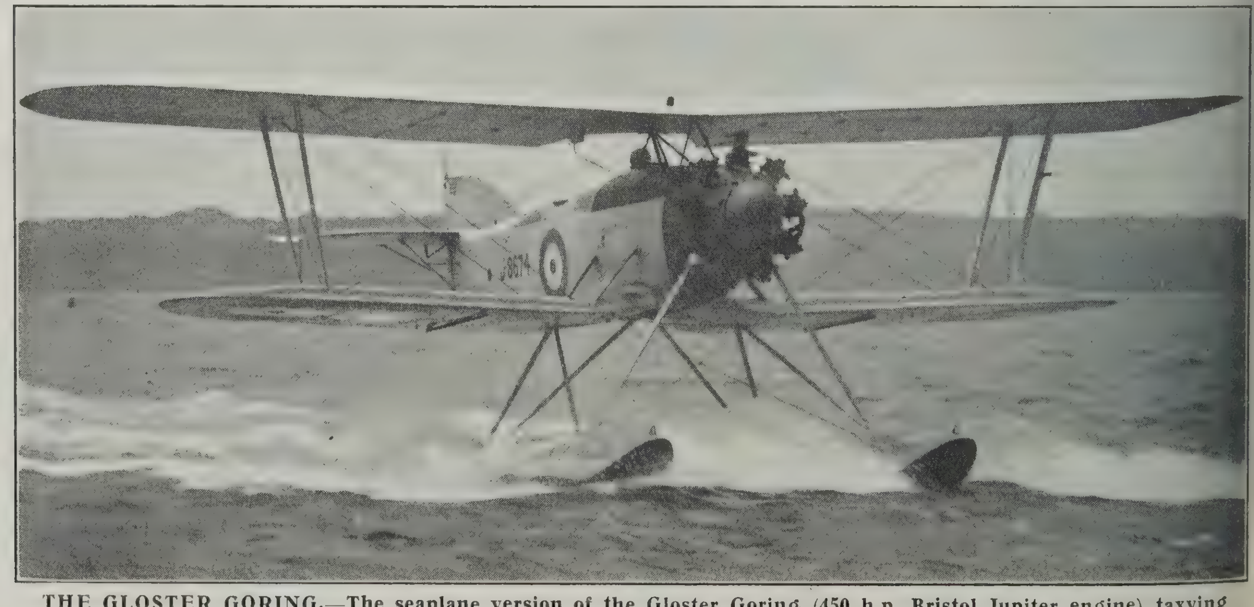
The Goring is designed primarily as a long-distance bomber, but it can readily be adapted to fulfil several other purposes by changing the essential equipment.

It has accommodation for a crew of two. The pilot's seat is situated immediately behind the rear-spar of the top plane, the latter being cut out to provide a view upwards. The cowling in front of this cockpit slopes down gently to the nose, providing an excellent view forward and downward. A considerable portion of the noses of the floats is in full view of the pilot, which greatly facilitate alighting and taking-off.

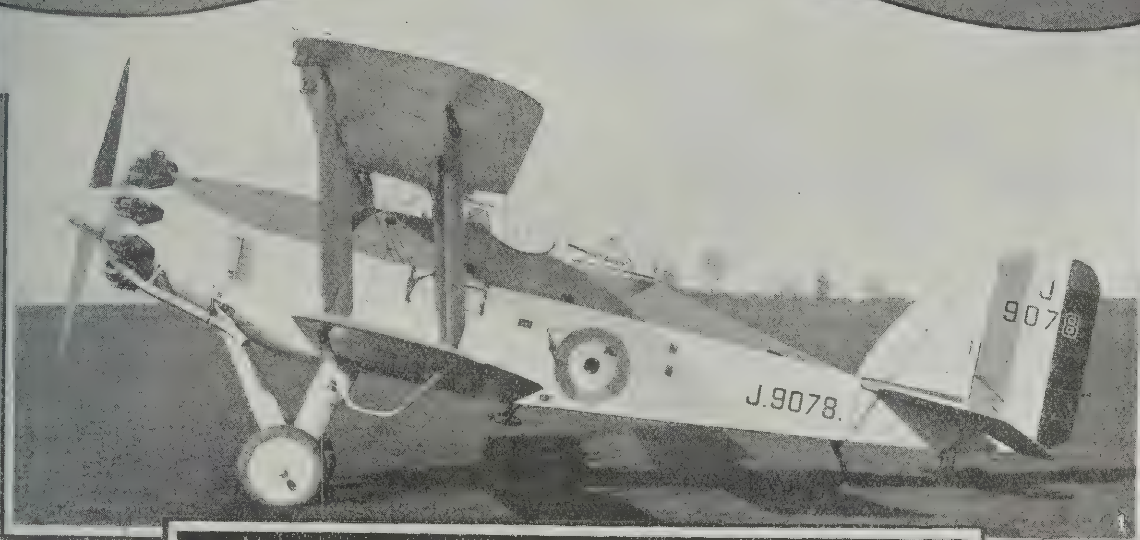
The gunner-observer's cockpit is behind the pilot's cockpit, far enough back to give an unobstructed downward vie behind the trailing edge of the bottom wing. The observe has two stations in this cockpit, one above the fuselag where he is provided with a Scarff gun-ring, and the othe at the bottom of the fuselage, which is provided with bom sights, etc. There is no spreader-bar between the floats af so that his view is not impeded downward along the lin of flight within the angle of vision provided from this station.

The fuselage is very roomy, and there is ample space fo the fitting of camera, wireless, bomb-gear and the variou equipment necessary for long-distance navigation. Bot pilot and observer have seats of special design. The pilot seat is mounted on the rear ends of two horizontal beam which are pivoted at their forward ends to the sides of th fuselage. This seat has an up-and-down movement of fou inches, and is adjustable during flight. The observer's se is fitted with rollers at each end running in channels fixe to the sides of the fuselage. This seat is held in its lowe position by a bolt, which when released allows the seat t be shot into a concealed position out of the way of th observer, thus giving him full freedom for fighting.

The wings—of the single-bay type—are of unequal chor



THE GLOSTER GORING.—The seaplane version of the Gloster Goring (450 h.p. Bristol Jupiter engine) taxying at Hamble. The clean lines of the machine are very noticeable.—(*"Aeroplane" photograph.*)



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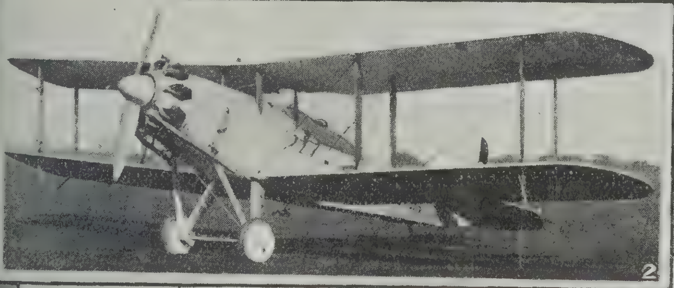
WESTLAND



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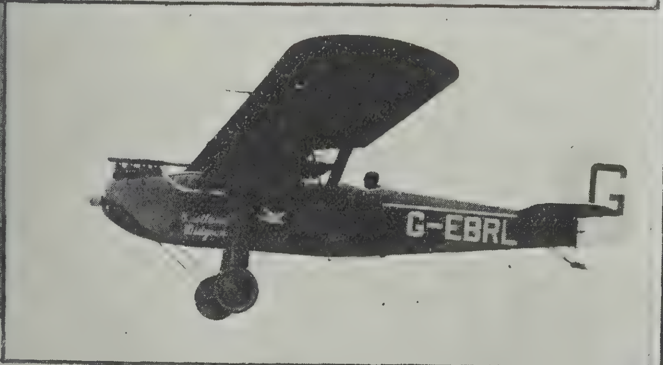

4

WESTLAND AIRCRAFT

THE WESTLAND WAPITI.

(Photos 1 & 2.)

With Jupiter VI engine. A General Purposes Aircraft suitable for reconnaissance, bombing, wireless and advanced training, etc. Fitted with Handley Page Automatic Slot Gear. As supplied to the Royal Air Force.

THE WESTLAND WIDGEON.

(Photos 3 & 4.)

An ideal light 'plane for the private owner, club use, etc. Robustly constructed to exceedingly high standards, a machine the excellence of which will be appreciated by the most experienced as well as the new pilot. Possesses exceptional controllability, even when in stalled flight. Folding wings—no rigging to require adjustment—excellent view for pilot and passenger. Low running costs.

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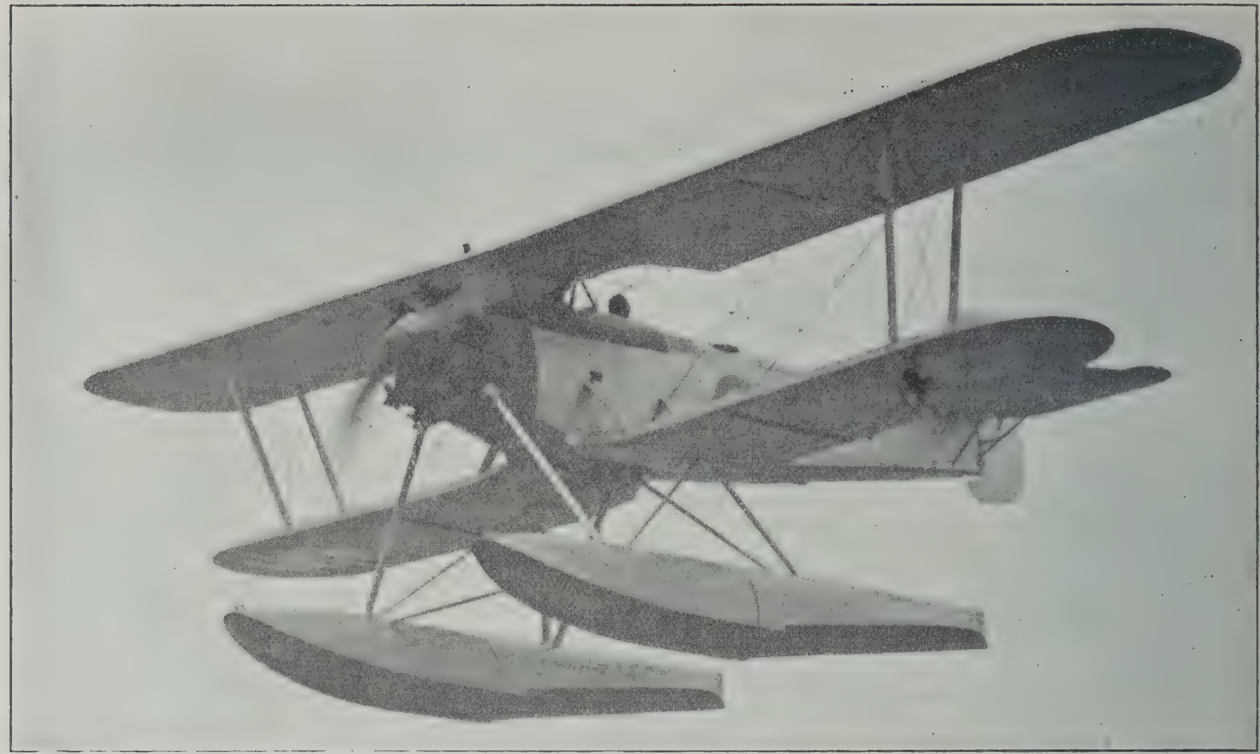

IN FULL FLIGHT.—The Gloster Goring seaplane (450 h.p. Bristol Jupiter engine) flying over Southampton Water piloted by Mr. R. H. Stocken.—(*" Aeroplane " photograph.*)

and span and are slightly staggered. The wing section used is of the high-lift Joukowski type, slightly modified. The top planes are attached to an inverted Vee cabane over the fuselage, and on either side of the fuselage there are accommodated the two main petrol tanks, each of 75 gallons capacity. Owing to the thick wing section employed these tanks fit entirely within wings.

The bottom wings are attached to two small stub wings, sloping outward and downward from the fuselage. These wing-stubs are braced to the fuselage by two pairs of short inclined struts, one pair on either side. Within these stubs are mounted two electric generators, one for wireless in the port, and the other for lighting and heating in the starboard stub respectively.

Ailerons, which are fitted to the top plane only, are mounted on ball-bearings and are controlled through a specially-devised and neat differential gear, the whole of which is contained entirely within the wing. Ailerons and elevators are operated by a very short control-column, which is pivoted to the elevator cross-shaft by a compact universal joint designed so as not to obstruct the bomber when in the prone position below the pilot. Instead of the normal type rudder-bar two stirrups are provided, each mounted on a pair of fore-and-aft steel-tube slides. The arrangement provides the pilot with a clear view of the bomber.

All controls are operated by swaged-rods. The only length of cable in the machine is a short piece between the aileron control gear, inside the cockpit, and the top wing, where the wire might be exposed to accidental damage. Most wires run direct without fairleads, but where a definite bend is required in the aileron wires a chain and sprocket is used.

All controls, etc., are lubricated by the Tecalemit high-pressure greasing system. The four hinges of the elevator are all connected together by a long, hollow hinge-pin running the full length of the elevator. The outer end of this hinge-pin is fitted with a Tecalemit fitting, so that the one point of application greases all the hinges at one operation.

The twin metal floats are constructed entirely of duralumin, anodically-treated, and in design and structure are similar to those fitted to the Gloster racing seaplanes.

The engine fitted at the moment is a standard Bristol Jupiter VI, but the machine was designed for the Jupiter VIII geared-engine, which is shortly to be installed. The engine is very neatly cowled, the lines of the cowling being continued forward by a Gloster type spinner, which is built integral with the airscrew.

The Goring is fully-equipped with all accessories required for its class, and is complete with all instruments, bomb-sights and calculators, camera, wireless, oxygen, guns and ammunition.

Specification of The Gloster Goring Seaplane.

Made by The Gloster Aircraft Co. Ltd., Sunningend Works, Cheltenham, Gloucestershire. (Two-seat long-distance bomber and reconnaissance seaplane.)

Wings.—Single-bay, staggered, biplane, top wing of larger chord and span than bottom. Ailerons on top wing only operated through differential gear. Normal timber construction.

Fuselage.—Rectangular section, domed top. Timber frame, wire braced and fabric covered.

Tail Unit.—Normal design. Rudder horn-balanced.

Undercarriage.—Two long single-step floats supported forward by two struts from the fuselage coupled by a spreader bar and aft by W struts of which the outer pair run up to the lower wing roots and the inner pair to the centre of the fuselage. No spreader bar aft. Diagonal tube bracing is fitted in the side panels of this system.

Power Plant.—One 450 h.p. Bristol Jupiter Series VI or VIII. Two fuel tanks, total capacity 150 galls. (680 litres) mounted in upper wing. Oil tank of 14 galls. (64 litres).

Accommodation.—Two open cockpits, pilot's behind cut back trailing edge of top wing and gunner's with Scarff-ring close behind. The occupant of rear cockpit can take a prone position below pilot's seat for bombing. Synchronised Vickers gun controlled from forward seat.

Dimensions.—Span, top, 42 ft. 0 in. (12.8 m.), bottom, 33 ft. 4 in. (10.15 m.), Chord, top, 7 ft. 0 in. (2.13 m.), bottom, 5 ft. 9 in. (1.75 m.), Wing area 450 sq. ft. (41.8 sq. m.).

Weights and Loadings.—Weight empty 3,200 lbs. (1,453 kg.), Crew (2) 360 lbs. (163 kg.), Fuel and oil 1,280 lbs. (582 kg.), Bomb load 690 lbs. (314 kg.), Miscellaneous 120 lbs. (54 kg.), Loaded weight 5,650 lbs. (2,570 kg.), Wing loading 12.55 lbs./sq. ft. (61.4 kg./sq. m.), Power loading 12.5 lbs./h.p. (5.72 kg./h.p.).

Performance.—(Jupiter Series VIII engine): Speed at 4,000 ft. (1,220 m.) 132 m.p.h. (211 km.h.), at 10,000 ft. (3,050 m.) 129 m.p.h. (206 km.h.), at 15,000 ft. (45.70 m.) 119 m.p.h. (190 km.h.), Minimum speed (sea-level) 49 m.p.h. (79 km.h.), Climb to 4,000 ft. (1,220 m.) 4.8 min., to 10,000 ft. (3,050 m.) 14.2 min., to 15,000 ft. (4,570 m.) 33 min., Endurance 6½ hours at 15,000 ft. (4,570 m.).

THE FRENCH AIRCRAFT-CARRIER BEARN.

The French aircraft-carrier *Béarn* is about to leave for a World Cruise fully equipped with aircraft.

Apparently the alighting arrangements are still giving dissatisfaction and some aircraft have been lost overboard—fortunately without fatal results.

All aircraft are fitted with a species of shepherd's crook which, on reaching the landing deck, is lowered to pick up a number of transverse cables to the ends of which are attached sandbags.

A recent experience with this braking device is not without humour.

A single-seat ship's fighter came in to land but after touching the deck the " shepherd's crook " broke before the landing speed had been reduced to much extent. The machine made several bounces, bending its metal airscrew badly. On reaching the bow of the ship the pilot opened up his engine in an effort to save himself from going overboard and took-off again. He succeeded in flying 13 kms. to Palivestre aerodrome where he landed successfully.

It is stated that one blade of the airscrew was bent double over the other but the pilot failed to notice any undue vibration!—" Sailors don't care."

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THE CURTISS ROBIN.

Some weeks ago The Aeroplane reported that the Curtiss Aeroplane and Motor Co. of Garden City, Long Island, N.Y., were designing a small commercial enclosed cabin monoplane to be fitted with the 90 h.p. Curtiss OX-5 engine. This machine, known as the Robin, has now been finished, and the first model has been flown from Curtiss Field, N.Y., to St. Louis, Mo., by Colonel Charles Lindbergh for delivery to the Curtiss-Robertson Airplane Manufacturing Company,—which company will be responsible for its production.

All the design work on the Robin has been done by the Curtiss Company. There is interest in noting that the design, stress analyses and laboratory tests alone involved an expenditure of $45,000, before the final specifications were approved and everything was ready for the construction of the first machine.

It was realised that for actual quantity-manufacture it would be impracticable and uneconomical for the Curtiss Company, as one of the largest producers of military aircraft in the United States, to attempt to build both military and commercial aircraft alongside in the same factory as the actual production of these two types are such widely different problems. As a result the Curtiss-Robertson Airplane Manufacturing Co. was formed in St. Louis with a capital of $500,000, and a new factory specially equipped for quantity production of commercial aircraft has been erected.

This company is managed by Major W. B. Robertson, who has long been associated with commercial aeronautics in the States. Mr. R. S. Damon, of the Curtiss engineering staff, will be in charge of production.

The Robin is a small three-seat high-wing cabin monoplane of characteristic American design, and, fitted with the 90 h.p. Curtiss OX-5 engine, will sell for approximately $4,000 (£800).

The performance of the Robin in actual flying tests shows it to be the fastest commercial aircraft in the popular OX-5 class. It has a top speed of 99.7 m.p.h. (which is some 10 per cent. higher than that possessed by the average open-cockpit OX-5-engined machine), a landing speed of 45 m.p.h. and a service ceiling of 12,750 ft.

The cabin has accommodation for three, with the pilot in front under the leading-edge of the wing and two side-by-side seats aft. Unusually narrow pillars provide an unobstructed vision for the pilot and excellent side vision is assured by large windows. Every precaution has been taken to make the cabin wind- and weather-tight and as nearly sound-proof as possible.

The wing is fixed to the top longerons of the fuselage and is braced on either side by a pair of inclined struts to the bottom longerons. The wing is built up of two spruce spars, with "Alclad" ribs, the whole being fabric-covered. Two petrol tanks, each of 25-gallons' capacity, are mounted in the wing, one on either side of the fuselage.

The fuselage is a welded steel-tube Warren truss with fabric covering.

The undercarriage is of the split type and consists of two telescopic legs attached to the front wing-bracing members, the bases of which are hinged to the bottom longerons of the fuselage by two half axles and two radius rods. The tail-skid is steerable.

The Robin has been built to conform to the U.S. Department of Commerce regulations.

Specification of the Curtiss Robin.

First model made by The Curtiss Aeroplane and Motor Co., Inc. Garden City, L.I., N.Y. To be produced by the Curtiss-Robertson Airplane Manufacturing Co., St. Louis, Mo. (Three-seater commercial cabin monoplane).

Wings.—High wing monoplane. Spruce spars, "Alclad" (duralumin coated with pure aluminium) ribs, fabric covered. Two bracing struts on each side.

Fuselage.—Welded chrome-molybdenum steel-tube framing, with Warren truss bracing, fabric covered.

Tail Unit.—Normal design, no control surfaces balanced.

Undercarriage.—Split-axle type. A vertical telescopic leg from the axle is attached to each front wing strut, which is braced above the undercarriage to the fuselage. Junction of telescopic leg and axle braced by radius rod running back to fuselage. A steerable tail-skid is fitted.

Power Plant.—One Curtiss OX-5 engine 90 h.p. with underslung radiator. Two fuel tanks (50 U.S. = 41 Imp. galls. = 188 litres total capacity), one in each wing.

Accommodation.—Pilot's seat under leading edge of wing. Two passenger seats side-by-side behind. All three seats inside a cabin whose front is formed by the pilot's wind screen running up to the wing. Cabin side windows can be opened.

Dimensions.—Span 41 ft. 0 in. (12.5 m.), Chord 6 ft. 0 in. (1.83 m.) Length 25 ft. 9 in. (7.85 m.), Height 7 ft. 10 in. (2.4 m.), Wing area 262.5 sq. ft. (24.3 sq. m.).

Weights and Loadings.—Weight empty 1,475 lbs. (670 kg.), Weigh of fuel (full tanks) 390 lbs. (177 kg.), Max. loaded weight 2,17 lbs. (988 kg.), Wing loading 8.2 lbs./sq. ft. (40.7 kg./sq. m.), Power loading 21.7 lbs./h.p. (9.9 kg./h.p.).

Performance.—Max. speed 99.7 m.p.h. (160.5 km.h.), Landing speed 45 m.p.h. (72.5 km.h.), Economical cruising speed 85 m.p.h. (13 (km.h.), Rate of climb from ground 450 ft./min. (137 m./min.) Climb to 3,800 ft. (1,160 m.) 10 mins., Service ceiling 12,500 ft (3,710 m.), Range at full throttle 580 miles (930 km.), Range cruising 785 miles (1,260 km.).

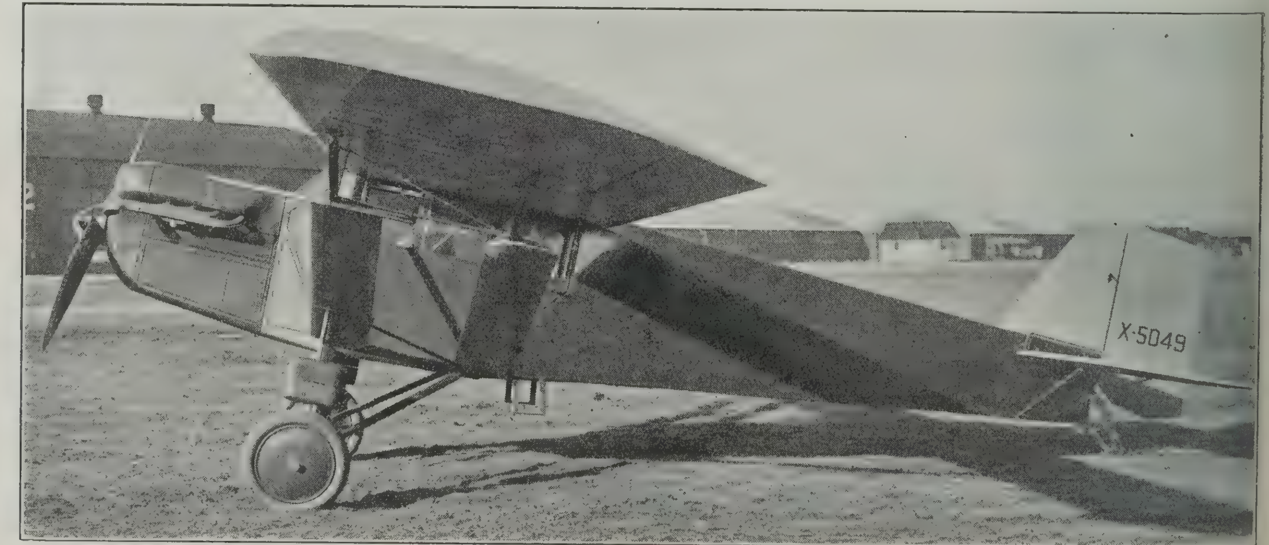
THE CURTISS CHIEFTAIN AIR-COOLED ENGINE.

A new twelve-cylinder air-cooled radial engine of 600 h.p. designed and built by the Curtiss Aeroplane and Motor Co was recently successfully flown for test purposes at Mitchel Field, N.Y. Fitted to a Curtiss Falcon two-seat reconnaissance biplane this engine gave to the machine a speed of 158 m.p.h., which it is said is as high as could be attained in this machine with any water-cooled engine of equal power.

This new engine, which is known as the Chieftain, was designed in an attempt to overcome the usually high frontal area of the ordinary type of air-cooled radial engine. It consists of two banks, each of six cylinders, with the cylinders in each bank arranged in pairs one directly in line with the other. In front view therefore only six cylinders are visible.

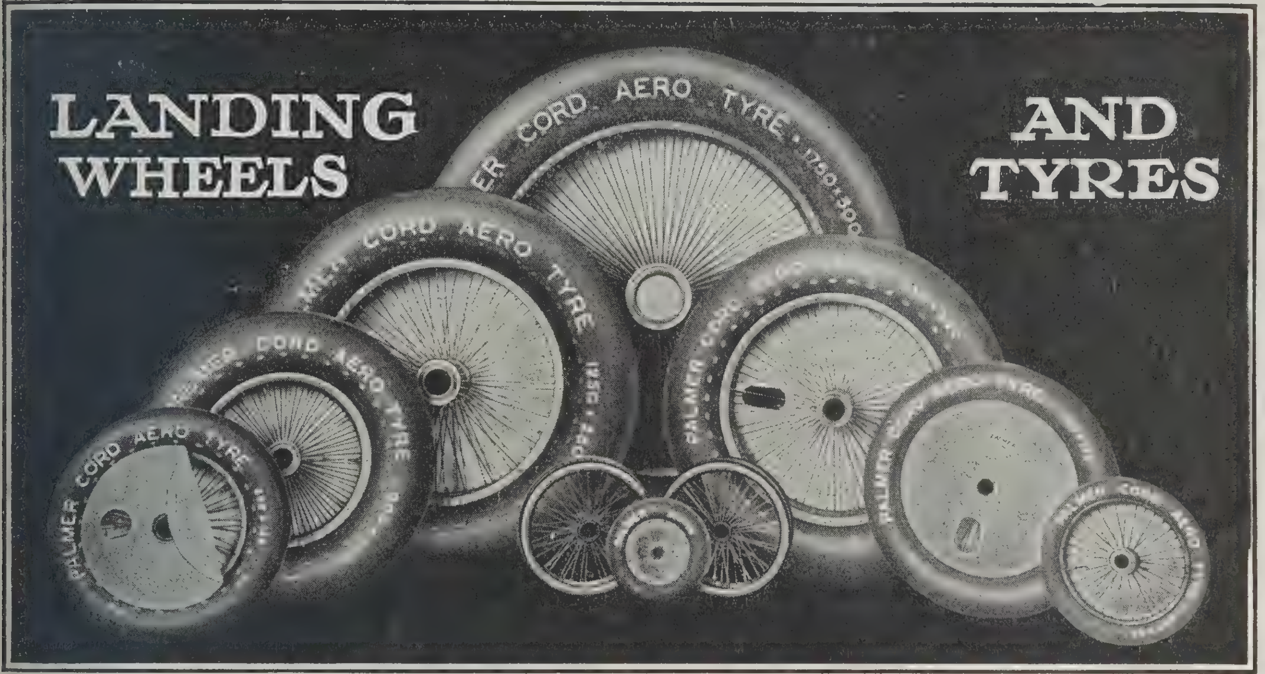
A two-throw crankshaft must be used for any radial engine having an even number of cylinders. In this case the pistons of three cylinders in each row must be coupled to each of the two throws of the crankshaft, and therefore the front crank-throw must be coupled to three pistons in the back row and vice versa. Quite how the connecting rod assemblies are arranged is not at present known. It is fairly certain however that the pistons in each pair of cylinders (front and back) are coupled to the same crank-throw as otherwise a rocking couple would be set up by inertia forces.

Each of the six pairs of cylinders is fitted with a short overhead camshaft, driven by a shaft running parallel to and in front of the cylinder axes. Cam and drive shafts, and overhead-valve gear are totally enclosed.



THE CURTISS ROBIN.—A side view of the latest Curtiss production, a three-seat commercial cabin-monoplane fitted with a 90 h.p. Curtiss OX-5 engine.

PALMER



STANDARD SIZES

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
"	172	130.	38.09	Central
575×60	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
800×75	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132/46
700×100	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
650×125	119	178.	55.	132/46
"	147	178.	55.	Central
"	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
"	162*	185.	55.	Central
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	177	185.	55.	135/50
"	183	185.	55.	Central
"	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
"	174	250.	80.	Central
"	182	185.	55.	Central
"	187	220.	66.67	Central
"	201	185.	60.32	125/60

Tyre Size	Wheel No	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900×200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	157	185.	80.	Central
"	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
"	136	250.	80.	Central
975×225	192	185.	60.32	Central
"	194	185.	55.	125/60
1250×250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750×300	139	400.	152.4	Central
"	191	350.	150.3	Central
1750×350	193	400.	125.	Central

Wheels Nos. 161, 162, 163 and 211 are of stronger type than the other wheels for 800 × 150 tyres. *†Wheel No. 169 is fitted with Ball Bearings.*
Grease gun equipment is now a standard fitting on all wheels.

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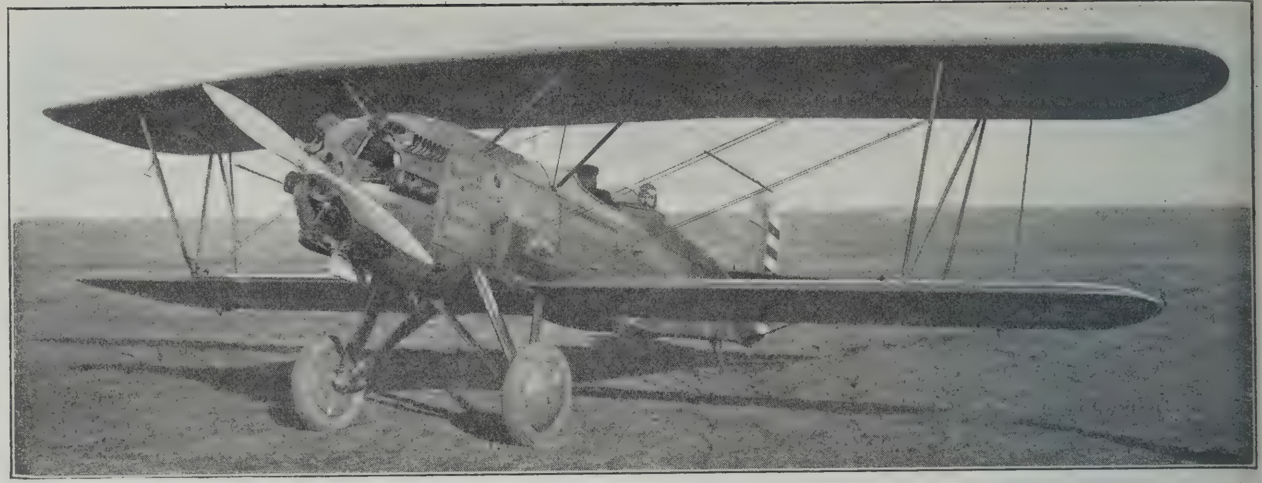


THE CURTISS CHIEFTAIN ENGINE.—The new 600 h.p. 12-cylinder two-row radial air-cooled Curtiss Chieftain engine installed in a Curtiss Falcon reconnaissance biplane for flight-test purposes.

Unfortunately no details of construction of this very interesting engine are as yet available.

Specification of the Curtiss "Chieftain."

Made by The Curtiss Aeroplane and Motor Co. Inc., Garden City, N.Y., U.S.A.

Type.—Twelve-cylinder, two-row, air-cooled radial. Front and rear cylinders in six lines of two each.

Cylinders.—5 5-8 in. (143 m/m.) bore x 5½ in. (140 m/m.) stroke. Total cylinder capacity 1,640 cub. in. (26,800 c.c.).

Valve Gear.—Overhead camshaft for each pair of cylinders. Cam and drive shafts and valves totally enclosed.

Crankshaft.—Two throw (without balance weights).

Crankcase.—In form a hexagonal prism.

Auxiliary Drives.—Oil pumps mounted below front of crankcase. All other auxiliaries at rear.

Carburettor.—Stromberg N.A.-U8J. Mixture delivered to an annular chamber surrounded rear of crankcase, thence by six inlet branches one to each line of two cylinders.

Airscrew Drive.—Direct.

Overall Diameter.—45 in. (1.14 m.).

Weight.—900 lbs. (409 kg.).

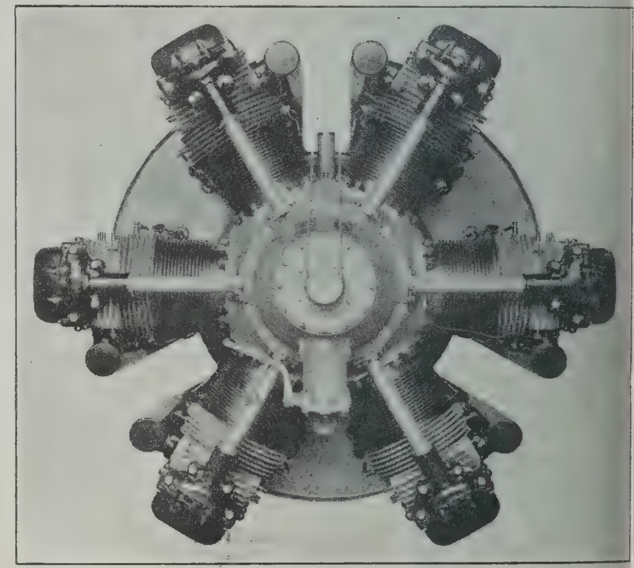
Performance.—615 b.h.p. at 2,200 r.p.m. Fuel consumption at 2,000 r.p.m. (b.h.p. not stated) 0.53 lbs. (0.241 kg.) per b.h.p. hour. Oil consumption 0.02 lbs. (.009 kg.) per b.h.p. hour.

QUICKENING-UP OCEAN MAILS.

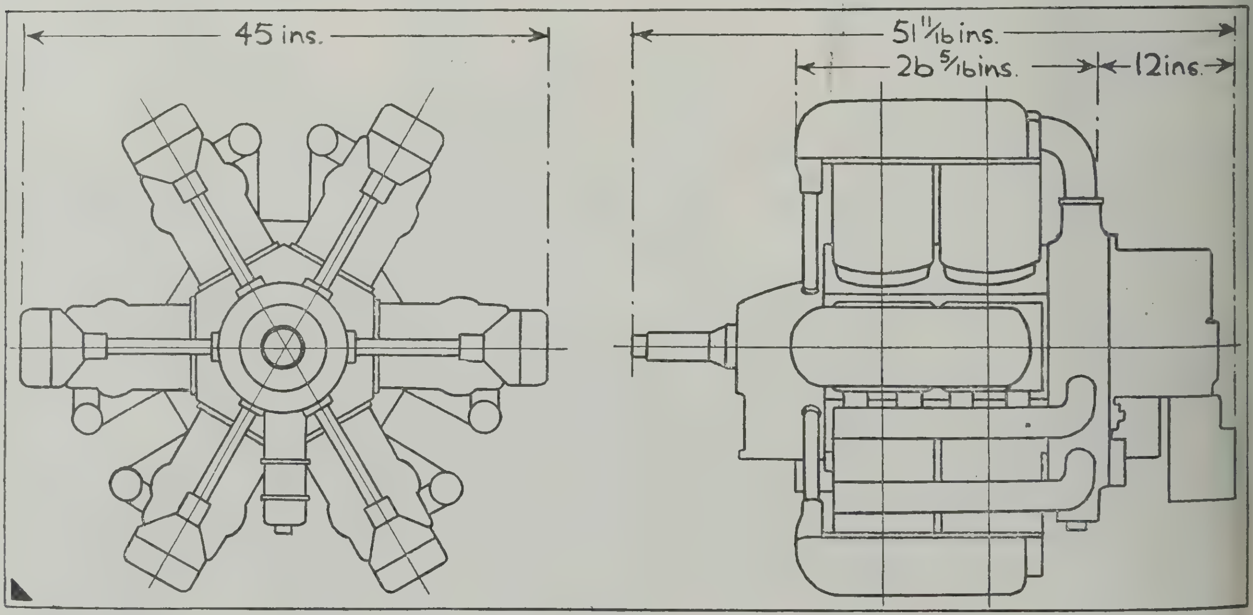
On May 10 the U.S. Air Corps non-rigid airship TC-5 alighted on the deck of s.s. *American Trader,* three miles off the Ambrose Light, two hours out of New York, picked up a package of mail and a representative of the U.S. Shipping Board and returned to land.

A special platform 20 ft. x 30 ft. was specially erected on the after-deck of the liner, and while the *American Trader* was steaming at six knots the airship dropped a trail-rope and was pulled down by a landing crew of 21.

The alighting of the airship on a ship's deck and th transfer of a passenger and mails some distance off shor is regarded as a demonstration of the possibility of shorte ing ocean passages by from 12—24 hours.



THE CURTISS CHIEFTAIN ENGINE.—A nose view of the new Curtiss air-cooled radial engine.



THE CURTISS CHIEFTAIN.—Outline diagram of the new 600 h.p. double-row 12-cylinder air-cooled radial engine produced by the Curtiss Aeroplane and Motor Co. Inc.

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USING A AND P COLD DRAWN WELDLESS STEEL TUBES

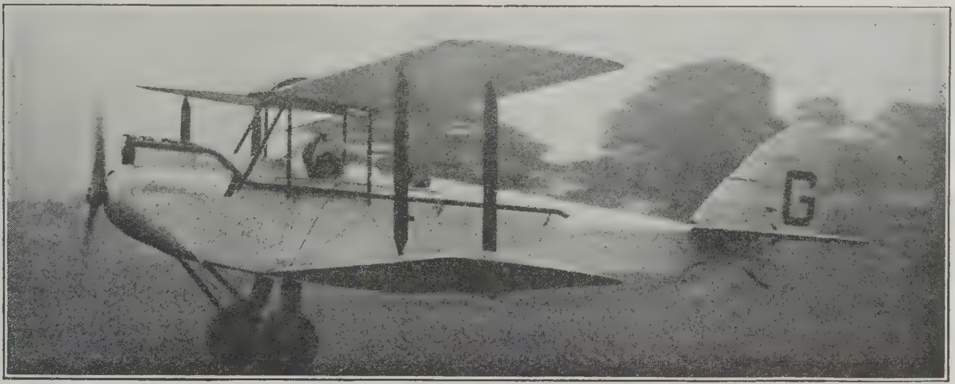
THE AVRO "AVIAN"

THE SHORT "SINGAPORE"

"IF IT'S MADE WITH STEEL TUBES, IT'S BEST MADE BY A AND P"

ACCLES & POLLOCK,
LIMITED

OLDBURY BIRMINGHAM



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TECALEMIT, LTD.,

LUBRICATION EXPERTS,

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MR STACK COMPLETES HIS TOUR.

On May 8, Mr. Neville Stack, flying the Avro Avian G-EBXD, with Mr. E. C. Bowyer of *The Daily News,* left Paris about 10.00 hours, flew to Lympne, for Customs formalities, and then landed at Shoreham where they stopped for lunch. After this they flew to Croydon, arriving at about 16.00 hours.

In the course of this tour, which began at Croydon on April 20, Mr. Stack and his passenger have flown a little over 4,000 miles and have visited France, Spain, North Africa, Sicily, and Italy.

As far as Madrid the tourists were dogged by misfortune. An indiscreet effort by someone unduly to cut down the petrol consumption of the Cirrus engine caused overheating and burnt valves, and made an engine overhaul necessary at Biarritz. Bad weather delayed the departure from Biarritz, and at Madrid an excited mule attacked the Avian and inflicted damage which caused some days' delay.

Madrid was left on April 30, and the trip thence to Croydon, via Seville, Oran, Algiers, Tunis, Catania (Sicily), Capua, Rome, Pisa, Marseilles, Lyons, Dijon, and Paris, was made in eight days, a very excellent piece of work on the part of both pilot and machine.

MOTH NOTES.

On May 7, Mr. Gerald Merton used his Moth for a house-hunting expedition on the assumption that, in spite of the excellent facilities offered by various purveyors of house property and others interested in it, he could obtain a much better estimation of the merits of the houses and their surroundings from quite a different viewpoint.

On May 13 Mr. McClure made a flight to Land's End and back on his private Moth.

On the same day Mr. Sydney St. Barbe, the chief instructor of the London Flying Club, accompanied by Mr. Francis St. Barbe, took a busman's holiday and made a tour on a Moth. They called at Bournemouth for lunch and at Sonning for tea on their way back.

It would appear that the "White Hart" hostelry and the river at Sonning are becoming regular attractions for Moth owners, with the "Bel and The Dragon" at Cookham a very close rival as a good pull-up for airmen.

A MOTH IN BATTERSEA PARK.

On May 3 Capt. A. S. White, chief instructor of the De Havilland School of Flying, was forced to land in Battersea Park while flying a Moth across London from Stag Lane to Croydon. When over Chelsea his engine began to misfire, but he succeeded in getting across the river and in choosing a suitable spot to land in spite of the crowds of people in the Park. He taxied across several cricket pitches without "breaking" any wickets before coming to rest.

AN AVIAN IN SWITZERLAND.

On April 6 Dr. René Clavel, who owns an Avro Avian III (A.D.C. Cirrus engine), left Bâle with M. Koepke as pilot, and flew to Naples by way of Lyons, Marseilles, St. Raphael, Pisa, and Rome, where he arrived on April 9.

He left Naples on April 19 and flew to Bellinzona, where he arrived the same day after stops at Rome, Pisa and Milan.

Owing to the fact that it was necessary to put on a new airscrew just before leaving Bâle and that this airscrew prevented the engine from giving more than 1,630 r.p.m. instead of the normal 1,850 r.p.m., it was decided not to attempt to fly over the Alps from Bellinzona to Bâle. The machine was therefore folded and put on a train, and it was flying again at Bâle at 10.00 hours the following morning.

The distance of 1,570 kms. (975 miles) from Bâle to Naples was covered in 12 hrs. 46 mins. flying time, and the return from Naples to Bellinzone, 780 kms. (485 miles), in 6 hrs. 20 mins. flying time.

The total fuel consumption on the flight was 35 litres (7.7 gals.) of petrol and 22 litres (4.84 gals.) of oil.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending May 13.

Flying Time 39 hr. 15 min. *Instruction* 21 hr. 20 min. *Soloists* 17 hr. 55 min. *Instruction.—With Mr. S. L. F. St. Barbe*—Mrs. Cook, Dr. Cook, Miss Wilson, Messrs. H. B. Saunders, J R. Rymill, S. Blythe, B. L. Middleton, A. D. Blumlein, J. A. Crane, H. Sutton, R. Ward. *With Mr. F. R. Matthews*—Miss V. M. Cholmondeley, Miss H. Cholmondeley, Miss Wilson, Messrs. P. Ward, A. D. Blumlein, J. R. Rymill, E. Richardson, A. J. Richardson, J. C. V. K. Watson, R. L. Portway, G. C. Gotheridge, P. A. Wills, G. Peckham, E. Davis, A. J. Richardson, R. Drysdale Smith, L. Swan, E. R. Andrews. *Soloists.*—Messrs. W. J. Roche-Kelly, C. E. Murrell, R. Sanders Clark, F. C. Fisher, J. C. V. K. Watson, A. J. Richardson, J. J. Hofer, R. Ward, J. A. Brewster, E. R. Andrews, P. W. Hoare, Will Hay.

On May 11 F. C. Fisher passed the tests for his Aviator's Certificate.

Meeting of Members.—The Meeting of the members held on May 7 to consider the proposals for the future policy of the Club was fairly well attended. The general opinion expressed by the members was that the Club should acquire six new machines of the latest type equipped with modern engines.

The proposal to issue debentures of £10 each up to £4,000 was unanimously approved, and the sum of £400 was definitely promised at the meeting. The particulars relating to these debentures will be issued within the next few days and it is hoped that all members will do their utmost to support the Committee in its endeavour to carry through these proposals, by taking up one or more of the debentures. The debentures will carry interest at 5 per cent. per annum, payable half-yearly on June 30 and Dec. 31, and will constitute a first charge on all the assets of the Club.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending May 5

Flying Time 36 hr. 20 min. *Instruction* 18 hr. 10 min. *Soloists* 11 hr 10 min. *Passenger Flights* 5 hr. *Tests* 2 hr. *Instruction.—With Mr Baker*—Messrs. Chart, Benson, Sellers, Stern, Mills, Faulkner, Weale Taylor, S. Riley, Garner, Tweedale, Watson, Fallon, Mason, Parks Stross, Greenhalgh, Taylor, W., Harrison, Goss, Barlow, Secker Pattreioux, Miss Hill, Miss Baerlein, Miss Emery. *Soloists (under instruction).*—Messrs. Tweedale, Brooking, Ruddy, Mills, Gort, Weale *Pilots.*—Messrs. Cohen, Davison, Nelson, Caldecott, Hall, Lacayo Michelson, Harber, Meads, Caldecott, Twemlow, Goodfellow, Williams Cantrill, Baker. *Passengers carried.*—9.

Report for week ending May 12.

Flying Time 31 hr. 15 min. *Instruction* 18 hr. *Soloists* 7 hr 35 min. *Passenger Flights* 4 hr. 50 min. *Tests* 50 min. *Instruction.—With Mr. Baker*—Messrs. Chart, Benson, Dewhurst, Sykes, Faulkner Stross, Fallon, Harrison, Riley, Scholfield, Goss, Davison, Taylor S. Sellers, Gort, Greenhalgh, Taylor, W., Garner, Johnson, Weale Stern, Pattreioux, Mills, Mason, Miss Baerlein, Miss Emery. *With Mr Cantrill*—Mr. Mills. *With Mr. Scholes*—Messrs. Fallon, Meads. *Soloists (under instruction).*—Messrs. Brooking, Ruddy, Tweedale, Mills, Goss (1st), Gort. *Pilots.*—Messrs. Williams, Hall, Caldecott, Harber, Fallon Cohen, Davison, Lacayo, Goodfellow, Twemlow, Scholes, Cantrill Michelson. *Passengers carried.*—14.

A most disastrous fortnight. QL was crashed by hitting a fence and is still out of commission. Mr. Goss did his first solo on RR but she was flying again within a week. MQ blew half a cylinder off and came down with various parts of the engine missing. Boy scouts are searching the neighbourhood for the balance.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending May 12.

Flying Time 30 hr. 25 min. *Instruction* 9 hr. 35 min. *Soloists* 19 hr 20 min. *Passengers* 1 hr. 30 min. *Instruction.—With Mr. Beck*—Messrs. Batcock, Bell, Blackburn, Crowther, A., Dr. Daly, Messrs. Gill, Hepworth, Ives, Lax, R., Ostler, Reynolds, Rhodes, Rowley, Senior, A., Senior, G., Shires, Sugden, Swift, Miss Wilson. *Soloists (under instruction).*—Messrs. Birch, Dick, Crowther, A. *"A" Pilots.*—Messrs. Ambler, Atcherley, R., Clayton, Crowther, H., Dawson, Humpheries, Lax, R., Lister, Norway, Thomson, Watson, Wilson, Wood. *"B" Pilots.*—Messrs. Fielden, Jones, Parkinson. *Passengers carried.*—9.

Another "A" Licence test was successfully made this week by Mr. Reg. Humpheries. Although on the first attempt he took the mark near which he had to land to be outside the Club-house door instead of the centre of the aerodrome, his final effort was very pleasing.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending May 12.

Flying Time 40 hr. 12 min. *Instruction.—With Flt. Lt. T. Rose and Mr. W. H. Sutcliffe*—Messrs. J. B. Briggs, S. Duckitt, H. Beamish M. Turner, G. Robson, E. C. Baxter, A. E. Coltman, E. P. Lane, S. G. Hall, G. E. C. Hill, T. H. Drury, W. M. Morris, H. Coleman, H. G Tower, J. Cobb, M. R. H. Baker, Capt. Chaytor. *Soloists.*—Messrs W. M. Morris, E. D. Wynn, E. J. Brighton, H. Tipper, J. Rowley, G. Robson, R. D. Bednell, S. H. Smith, C. W. Fellowes, R. L. Jackson, W. Swann, A. Ellison. *Passengers carried.*—9.

Mr. S. G. Hall was launched solo on Saturday.

"Wulfrun," the new "X" Moth presented to the Club by Messrs. J. D. and N. D. Graham, of the *Express* and *Star,* Wolverhampton, was flown from Stag Lane by Flt. Lt. Rose on Monday, and has been in great demand during the week.

Air Vice-Marshall Sir W. Sefton Brancker visited the aerodrome in "DCA" on Sunday, the 13th inst., and inspected the Club.

A new record was set up of over forty flying hours this week.

The Club will be represented at the Hampshire Air Pageant by Flt. Lt. Rose on EBLT, and Mr. R. G. Cazalet on his Widgeon "RM."

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending May 13.

Flying Time 66 hr. 30 min. *Instruction* 26 hr. 20 min. *"A" Pilots* 20 hr. *Soloists* 9 hr. 55 min. *Passenger Flights* 9 hr. *Tests* 1 hr. 15 min. *Instruction.—With Flt. Lt. Swoffer.*—30. *Passengers carried.*—28, by Flt. Lt. Swoffer, Capt. Kirby, Mr. Cripps, Mr. McKechnie, Mr. Baynes and Mr. Oliver.

We have this week broken our record week of 57 hours by 9 hours 30 minutes, bringing the week's total up to 66 hours 30 minutes. New flying members are joining every day.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending May 12.

Flying Time 11 hr. 30 min. *Instruction.—With Mr. Fry*—Messrs. A. A. Rice, C. Bourget, A. Wade, G. Barker. *Soloists.*—Messrs. H. Pank, R. Potter, A. A. Rice, G. Barker, R. T. Harmer, G. Surtees, H. Mack, F. Gough. *Passengers carried.*—8.

The chief event of importance this week was the visit of Sir Samuel Hoare, who flew from Northolt Aerodrome in a Bristol Fighter, with slotted wings, on Saturday last. Sir Samuel was very pleased with everything he saw and congratulated the management on the great progress made by this Club, its membership in 12 months being over 300. The Chairman, Capt. A. A. Rice, M.C., ex-Sheriff of Norwich and founder of the Club during his year of office, went solo in just under four hours' instruction and put up an exceptionally good show.

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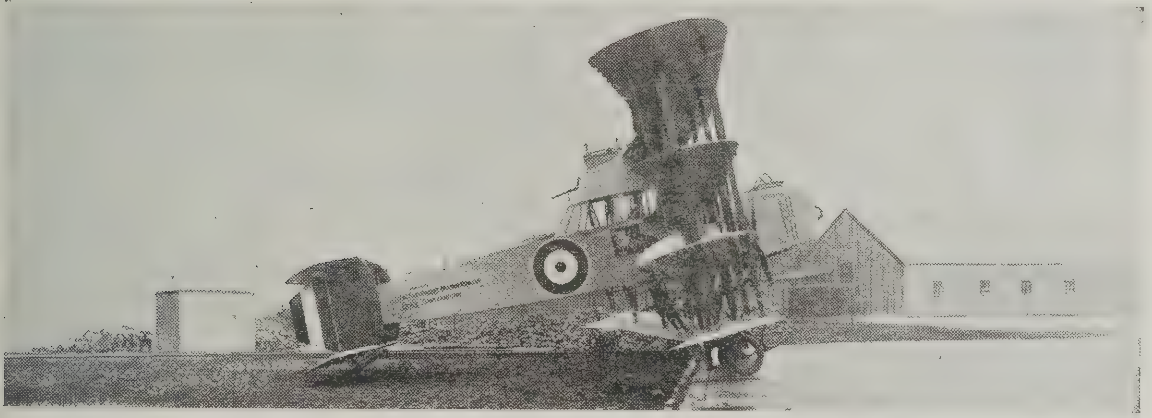

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One of our members has let us down. In taxying across the aerodrome (320 acres) he went bang into a temporary canvas hut erected for the Territorials now in camp on the aerodrome. They only occupy one corner of 20 acres and from the air their tents can be seen from 1,000 feet over fifty miles away. Since the formation of this Club no less than five similar accidents have happened, causing a financial loss of nearly £250 to the Club, in addition to the flying time lost. Such accidents are due to absolute carelessness and are extremely disheartening. If members would consider the machines their own private property when in their charge the Club would be much better off.

The occasion of H.R.H. the Prince of Wales's visit on May 30 is developing into a big affair, and accommodation is being made for about fifty visiting pilots and applications continue to arrive. An open invitation is issued to all interested in aviation to come along and accept our hospitality.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for the month ending May 13.

The Pageant, however, is now happily over and full reports of it have already appeared in the Press. We had very full entries and a good attendance. The weather kept fine until the last events in the programme, when a thunderstorm drove many of the spectators away.

We had the pleasure of greeting our Chairman, Mr. A. H. Downes-Shaw, on his return from his overseas journey in his private Moth. Accompanied by Mr. Jopp, he left this aerodrome for Nice, flying via Croydon, Lympne, and Paris. The undertaking was a memorable one in the history of the Club and will undoubtedly give a great stimulus to the efforts of other members. We are hoping that Mr. Downes-Shaw will write a full account of his journey for publication.

We deeply regret to announce that two of our members, Mr. R. E. Hopper and Mr. D. Tanner, met with a fatal accident on Sunday, May 6, when the Club Moth GEBSN crashed near the aerodrome. We are very grateful for the numerous expression of sympathy received from many quarters.

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending May 12.

Flying Time 11 hr. 35 min. *Instruction* 5 hr. 40 min. *"A" and "B" Pilots* 2 hr. 45 min. *Soloists* 1 hr. 35 min. *Passenger Flight* 1 hr. 20 min. *Tests* 15 min. *Instruction.—With Mr. Lowdell*—Dr. Dunn, Miss Edwards, Miss Rhodes, Dr. Mildred Yate, Messrs. G. Smith, F. Verney and G. Goodwin. *"A" and "B" Pilots Solo.*—Mr. C. N. Prentice, Dr. J. C. Sleigh and Mr. S. Schofield. *Soloists (under instruction).*—Miss Edwards, Messrs. R. Brown, C. Hanson, G. Smith, and F. Verney. *Passengers carried.*—9.

Mr. Geoffrey Smith made a successful first solo during the week. Mr. R. Brown has received his R.Ae.C. Certificate, but is still awaiting his "A" Licence from the Air Ministry. High winds and rain prevented flying on Tuesday and Wednesday, as most of our members now under instruction are now at the solo period prior to going for their "A" Licence test.

The Club will be closed for the Whitsun Holidays, from May 25 to May 29. During this period the whole of the fleet, the staff and many of the members will take up their abode at Hamble to take part in the Hampshire Air Pageant.

The Newcastle-upon-Tyne Aero Club.

[Sec.: A. H. Bell, Cramlington Aerodrome, Northumberland.]

Report for week ending May 6.

Flying Time 20 hr. 55 min. *Instruction* 3 hr. 15 min *Soloists* 30 min. *"A" Pilots* 12 hr. 35 min. *Tests* 1 hr. 15 min. *Passengers* 3 hr. 20 min. *Instruction.—With Mr. Parkinson.*—Messrs. Redshaw, Hayton, L. Middleton, Cochrane-Carr. *Soloist.*—Dr. Alderson. *"A" Pilots.*—Mrs. Heslop, Messrs. Turnbull, Runciman, Stobie, Irving, Stawart, R. N. Thompson, A. Bell. Passengers were carried by Mr. J. D. Irving, Mrs. Heslop, Mr. R. N. Thompson, Mr. Parkinson and Mr. A. Bell.

A member doing his height tests had reached about 6,500 feet Among the spectators were the candidate's parents. His mother remarked that he appeared to be very high. A Pilot standing near mentioned that the pupil had gone to heaven and that his parents would never see him again, when his mother replied in a surprised tone, "Where do you expect father and me to go?"

Report for week ending May 13.

Flying Time 23 hr. 55 min. *Instruction* 5 hr. 45 min. *"A" Pilots* 16 hr. 30 min. *Passengers* 35 min. *Tests* 1 hr. 5 min. *Instruction.*—Messrs. Cochrane-Carr, Griffiths, Runciman, Redshaw, Jones, Fairless, Wilson, Lawson, Lloyd-Browne. *"A" Pilots.*—Mrs. Heslop, Messrs. Stawart, P. F. Heppell, Stobie, H. Ellis, De Pledge, Turnbull, Lloyd-Browne, Runciman, C. Thompson, R. N. Thompson, Horn, J. Irving, Wilson.

Mr. Norman Jones called on Thursday on his Moth, "Camberwell Beauty," for lunch and petrol. QV came back onto service after overhaul or renewal of C. of A., and Mr. Brown promptly took LX off service for top overhaul of engine. Engineers appear to take a delight in taking machines off service on every positive pretext. We suppose it is for the best. But why do they always choose fine weekends for the work?

The Southern Aero Club.

[Sec.: C. A. Boucher, Shoreham Aerodrome, Sussex.]

On Saturdap next, May 19, our Flying Display takes place. A number of people have promised to come and support us and the show should be extremely interesting. Amongst the machines which will be seen are the Avro 504K (Le Rhône), Gosport, Lynx, and Avian, Avro "Baby," Blackburn Bluebird, Moth, and S.E.5. The programme begins at 2.30 p.m., and the first event is a parade and fly past of aircraft taking part. An instructors' obstacle race, in which the victims have to run to the middle of the aerodrome and don various garments before starting up their Avros and flying a circuit, should cause some amusement. A demonstration of a slotted Moth will be given, and will be followed by a balloon-bursting competition.

Various wing-walking and stunting displays will be given, and there will be a folding competition between the light aeroplanes. A taxi-ing competition is the next item, after which there will be a height-judging contest for the spectators. The grand finale will be the bombing and complete destruction of a native citadel, a most realistic-looking affair of aluminium-covered fabric and so on.

Several handsome prizes are being awarded, amongst these being silver cups, one of which is being presented by Mr. F. P. Raynham, in addition to propeller clocks and other useful utensils (?).

We hope to attract a large crowd by this novel programme.

The Cinque Ports Flying Club.

[Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

Report for May 12 and 13.

Flying Time 6 hr. 5 min. *May 12.—Test flight* 5 min. *Joy-rides.—With Mr. Neville Stack*—Mrs. Twaites, H. W. Hunt, T. A. Somerset Webb, T. A. M. Stuart Lewis, 15 min. each. *Instruction.—With Mr. Stack*—Mr. F. E. Story, 30 min., Mr. H. E. Twaites 15 min., Capt. F. D. Little 30 min., Mr. R. Dallas Brett 30 min. *May 13: Joy-rides.—With Mr. Neville Stack*—Mr. Maurice Braddell, Capt. L. A. R. Braddell, 15 min. each. *Instruction.—With Mr. Stack*—Capt. F. D. Little 15 min., Mr. W. H. Evernden 15 min., Mr. H. W. Hunt 15 min., Mr. Maurice Braddell 30 min., Mr. F. E. Story 45 min., Mr. R. Dallas Brett 45 min.

The reports that the Club had engaged a Pilot Instructor were unfortunately incorrect, and this post has yet to be filled. We hope to engage someone very shortly.

Mr. Neville Stack of A.D.C. Aircraft landed at Lympne on his return from a Continental tour, and hearing of our difficulties, most sportingly offered to come down and instruct for us on Saturday and Sunday. He arrived on Saturday in a D.H.9 C. Puma just before lunch, and we were able to do two hours 50 minutes before he had to return to Croydon.

On Sunday he arrived at 11.30 and we put in three hours fifty minutes' flying.

The Committee and Members are extremely grateful to Mr. Stack for so sportingly coming to our assistance. The keenness of the members augurs well for the time when we start with a permanent Instructor.

The Edinburgh Aero Club.

[Hon. Sec.: T. J. Connolly, 20, Leith Walk, Leith.]

This Club hopes to have their first machine within the next two weeks. A well-known experienced and skilful pilot is likely to be associated with the Club at an early date.

There are four grades of membership: Pilot members at £4 per year; Observer members at £2 per year; Associate members at £1 per year; and Honorary members. With an entrance fee of £1 1s. for Pilot members and Observer members, and of 10s. for Associate members.

Full particulars concerning the Club can be had from the Hon. Secy., Mr. T. J. Connolly, 20, Leith Walk, Leith, Edinburgh.

The Brisbane Flying School.

In the first year's operations of this School, which is operated by the Queensland and Northern Territory Aerial Services Ltd., with two D.H. Moths (A.D.C. Cirrus II engines), a total of 615 hr. 10 min. was flown with only one slight accident, involving a damaged undercarriage and fuselage.

In this period 5,086 flights were made and ten pupils were trained for their "A" licence. This latter figure fell below expectations, but this was due to the fact that flying instruction was practically suspended during January, February and March owing to the state of the aerodrome, which became very soft during the rainy season. Taxi trips were undertaken by the School to Sydney, Grafton, Warwick, Toowoomba, Pittsworth, Camooweal, Emerald, Rockhampton and Bundaberg.

A total of 1,599 joy-ride and taxi passengers were carried in the two Club Moths.

At the conclusion of the first year's operations there were 14 pilot members, 7 pupils under instruction, 3 pupils on the waiting list. The total staff employed was one Manager Instructor and one Ground Engineer.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending May 13.

Flying Time 145 hr. 55 min. *Instruction.—Dual* 45 hr. 20 min. *Sol* 76 hr. 50 min. *Other Flying* 23 hr. 45 min.

Four pupils successfully accomplished first solo flights during the week, and three others, including Miss W. E. Spooner, passed their night-flying tests for "B" Licences.

Ten new Moths were tested and despatched to their various destinations.

Experiments with the "slotted wings" have been so far advanced that a Moth, fitted with this "fool-proof" device, has been flown to the Continent by Sq. Ldr. England, where he will give demonstrations in many countries.

On Saturday we were all taken by surprise at the unexpected appearance at Stag Lane of Lt. R. R. Bentley, who has flown his Moth back from South Africa. We extend our heartiest congratulations to him on the successful conclusion of a brilliant flight.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending May 10.

Flying Time 35 hr. 30 min. *Instruction.—With Col. G. L. P Henderson*—Miss Kidstone, Messrs. Brooks, Bellville and Dr. Forsyth *With Mr. H. D. Davis*—Messrs. Quilter, Fowler, Hsiao, Oliver, Hughes Hamilton, Dr. Forsyth and Dr. Wall. *With Mr. A. E. Golds*—Messrs Nunn, Oliver, Van Gessel, and Dr. Forsyth. *Soloists.*—Messrs Whiteley, Patton-Bethune, Dr. Wall, Anderson, Hughes, Hsiao, Allen Hamilton.

Mr. Hamilton has passed all his tests for his "A" Licence and as he has only been given 6 hrs. 30 mins. dual, the case is worth of note. Mr. Hsiao has now passed his tests and as he had considerable difficulty at first, we would like to congratulate him on very fine show at piloting. Mr. Hughes is now ready for his Heigh Test and several other Pupils almost ready for Solo.

Berlin to London in fastest time on record!

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 6; Monday, 27; Tuesday, 28; Wednesday, 29; Thursday, 25; Friday, 29; Saturday, 30.

Imperial Airways Ltd. :
London — Paris — Zurich; London — Ostend — Brussels — Cologne : Machines 70, passengers 596, freight 18 tons.

Air Union :
Paris—London : Machines 43, passengers 167, freight 12½ tons.

K.L.M. :
Amsterdam—Rotterdam—London : Machines 13, passengers 97, freight 5⅓ tons.

Sabena :
Brussels—London : Machines 12, passengers 47, freight 1½ tons.

Deutsche Lufthansa AG. :
Amsterdam—London : Machines 30, passengers 58.

Private :
Machines 4, passengers 4.

Total number of trips by British Machines, 70, carrying 596 passengers. Foreign Machines, 98, carrying 369 passengers.

COMPARATIVE FIGURES.

Week ending May 13 :
Machines, 168; Passengers, 965; Crews, 329; Total personnel, 1,294.
Corresponding week, 1927 :
Machines, 117; Passengers, 650; Crews, 192; Total personnel, 842.
Corresponding week, 1926 :
Machines, 165; Passengers, 677; Crews, 221; Total personnel, 898.
Corresponding week, 1925 :
Machines 154; Passengers, 538; Crews, 191; Total personnel, 729.
Corresponding week, 1924 :
Machines, 81; Passengers, 271; Crews, 130; Total personnel, 401.
Corresponding week, 1923 :
Machines, 105; Passengers, 353; Crews, 175; Total personnel, 528.
Corresponding week, 1922 :
Machines, 162; Passengers, 337; Crews, 195; Total personnel, 532.
Corresponding week, 1921 :
Machines, 89; Passengers, 350; Crews, 106; Total personnel, 456.
Corresponding week, 1920 :
Machines, 91; Passengers, 138; Crews, 98; Total personnel, 236.

Croydon Notes.

Before the war the earlier hours of the morning, particularly in Spring and Summer, were always thought the most suitable for flying. This opinion seems to have been revived at Croydon lately, for Imperial Airways now start their first machine for Paris at 06.45 hrs. There are usually at least three machines away from the aerodrome by 08.00 hrs, and anything up to six by 09.00 hrs.

Moreover, these machines carry quite respectable numbers of passengers. On Monday last twenty-two, on Tuesday seventeen, on Wednesday twenty-five, on Thursday fifteen and on Friday fifteen passengers had left Croydon before 09.00 hrs. Air travel and early rising evidently go together.

At the same time flying is extending at the other end of the day. The last regular service into Croydon is due to leave Paris at 16.45 hrs. and has been known to arrive as late as 20.25 hrs. There is a distinct probability that this Summer will see the beginning of a regular evening service to and from Croydon which will enable passengers to travel after an early dinner and arrive at their destination at round about 22.00 hrs.

So far however Croydon's night-landing equipment has not been needed for regular service. A little while ago one airline machine delayed on its way by a minor trouble reached Croydon after dark and everything was duly lighted up for it. However the pilot forgot to fire the correct landing signal and reached the ground while the flood-light was still gyrating on its turn-table.

And on Thursday of last week the lighting system was used to enable Miss Spooner, of the London Aeroplane Club, and Mr. Malcolm, of the De Havilland Aircraft Co. Ltd., to make the night-landing tests required of all candidates for a "B" licence.

For about a couple of hours on Friday of last week the only Imperial Airways machine that could be discovered at Croydon Aerodrome was one undergoing a complete overhaul. Every other machine in their fleet was on a service or at a foreign aerodromes. And judging by the figures of the week's traffic a similar state of affairs must have occurred on most days.

The Friday afternoon "tea flight" over London, which was such a success last Summer, was begun again this week. The somewhat depressing weather of Friday morning did not encourage many passengers to turn out for the occasion

AIR MAILS.

A new edition of the Air Mail Leaflet has just been issued by the British Post Office, which gives a very complete guide to the majority of the Air Mail services of the World as they can be of service to those wishing to use them from this country.

The leaflet covers practically all the Air mail routes of the World, including those in Europe (and Russia), Africa, the Middle-East, North and South America, but curiously enough does not mention any of the Australian services, which can offer very marked savings of time on letters to some parts of Australia.

Apart from this omission the guide seems very complete. It gives the general regulations concerning the despatch of Air mails, rates of postage, both for letters and parcels; latest times of acceptance at the G.P.O., London, for packages destined for the various routes, and a guide to the time which may be saved by the use of each route.

Copies of the leaflet are in stock at many of the more important Post-offices in this country, and can be obtained at short notice through any Post-office.

The leaflet certainly should be in the hands of all those who have foreign correspondence which is in any way urgent.

MR. VAN LEAR BLACK'S DEPARTURE.

Mr. Van Lear Black left Croydon Aerodrome at about 06.25 hours on the morning of May 14 on a trip the first objective whereof is Cape Town, which is ultimately to be extended to Tokyo and then back to Croydon—a total of about 40,000 miles.

His machine is the Fokker F.VII-3m, H-NADP, fitted with three Gnôme-Rhône-built Bristol Titan engines, which Mr. Black has chartered from the K.L.M. Mr. Geyssendorffer and Mr. Scholte, of K.L.M., are acting as pilots, and Mr. Weber, also of K.L.M., is the engineer. Mr. Leo Bayline, Mr. Black's valet, is also accompanying the party.

In addition to the personnel and their personal luggage, the machine carries an ample stock of spares and tools, emergency camping gear, including mosquito-nets, and at the time of leaving Croydon enough fuel for a non-stop flight to Venice, if weather conditions prove reasonably favourable.

With this very respectable load H-NADP took off from Croydon this morning in a very short time, and showed that her engines had an ample reserve of power.

AMERICAN ENTERPRISE.

Mr. Art Goebel, who was one of the winners of the notorious Dole Prize for the flight from San Francisco to Hawaii, has taken a Fairchild Cabin Monoplane (Whirlwind engine) to Japan to demonstrate the usefulness of the machine and the Fairchild camera for air survey work. Mr. Goebel started from New York on a Sunday afternoon and jaunted in a leisurely way across the States to San Diego, Cal., arriving there the following Wednesday morning,—about two days quicker than he could have made the journey by train. The Fairchild camera has been used for several years by the Japanese Army and Navy as standard equipment, so the latest type starts with a ready-made reputation.

SATISFACTION.

Yorkshire Aeroplane Club Ltd.—Satisfaction in full and cancelled by the Air Ministry on April 2, 1928, of debenture dated July 28, 1926, securing all sums not exceeding £2,000 liable to become due under an agreement dated June 18, 1926.

PERSONAL NOTICES.

Deaths.

BOLTON.—On May 12, at Farnborough, as the result of a flying accident, AC. John George Bolton, R.A.F.

BRADFORD.—On May 10, at Invergordon, as the result of a flying accident, Cpl. Ernest Bradford, R.A.F.

CARTER.—On May 12, in hospital at Aldershot, as the result of a flying accident at Farnborough on the same day, Telegraphist Percival Reginald Carter, R.N., attached R.A.F.

THOMAS.—On May 11, at Old Sarum, Wiltshire, as the result of a flying accident, L-AC. Donald Martin Thomas, R.A.F.

UNDERDOWN.—On May 11, at Old Sarum, Wiltshire, as the result of a flying accident, Gerald Arthur Underdown, Flg. Off., R.A.F.

Mr. Underdown entered the R.A.F. with a S.S. comn. in January,

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1926. After a course of flying instruction at No. 2 Flying Training School, Digby, he was posted to No. 16 (Army Co-operation) Squadron at Old Sarum.

MARRIAGE.

ROUGH—DAVIS.—On May 7, at Maidenhead, Berks, Flt. Lt. Herbert Leonard Rough, R.A.F., eldest son of Mr. E. G. Rough and the late Mrs. Rough, of Victoria, British Columbia, to Edith Margaret, only daughter of Mr. and Mrs. G. R. Davis, of Altwood Bailey, Berks.

FORTHCOMING MARRIAGES.

DUNNE—TWISTLETON-WYKEHAM-FIENNES.—The engagement is announced, and the marriage will shortly take place, between John William Dunne, eldest son of the late General Sir John Hart Dunne, K.C.B., and Lady Dunne, and Cecily, only daughter of Lord and Lady Saye and Sele.

[Mr. Dunne will be remembered in the very early days of flying as the designer and pilot of a tailless broad-arrow-shaped biplane, and later of a successful tailless monoplane, with which experiments were made to discover inherent stability. With the Earl of Tullibardine (now the Duke of Atholl) he formed the Blair-Atholl Syndicate Ltd. for experiments with these craft. After secret experimental work at Blair Atholl in Perthshire he migrated to Eastchurch, where many successful flights were made.

In 1914 a Dunne tailless monoplane flew from London to Paris piloted by Commandant Felix, of the French Navy. In America the Dunne patents were acquired by the Burgess Company but the War ended further experiments.]

SINCLAIR—JEWELL.—The engagement is announced between Flt. Lt. Findlay Willard Sinclair, D.F.C., R.A.F., youngest son of Mr. and Mrs. F. D. Sinclair, of Calgary, Alberta, Canada, and Dora, only daughter of Mr. and Mrs. Washington Jewell, of Bulland, Hadley Grove, Barnet, and Wiveliscombe, Somerset.

TROTTER—HENRY.—The marriage between Mr. Frederick Albert Trotter (late R.A.F.), youngest surviving son of Canon John Crawford Trotter and Mrs. Trotter, of Glenleary, Ramelton, County Donegal, and Miss Dorothy Isabel Henry, M.B., elder daughter of Mr. James Henry, K.C., and Mrs. Henry, of 32, Belgrave Square, Dublin, will take place quietly in June.

WALMSLEY—PIM.—The marriage arranged between Flt. Lt. Hugh S. P. Walmsley, M.C., D.F.C., R.A.F., and Miss Audrey M. Pim will take place at Sleaford on June 1.

BIRTHS.

LIVINGSTON.—On May 9, at 27, Welbeck Street, to Lorna, wife of Sq. Ldr. P. C. Livingston, F.R.C.S.E., R.A.F.—a son.

McCLURE.—On May 8, at 16, North Court, Wood Street, Westminster, to Beatrice, wife of Ivor H. McClure—a son.

SHEPPERD.—On May 4, at 3, Kingston Terrace, Sleaford, Lincs, to Olive (*née* Godson), the wife of Capt. H. E. Shepperd, late R.F.C. and R.A.F.—a son.

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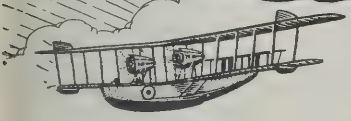

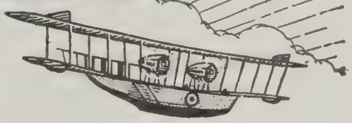

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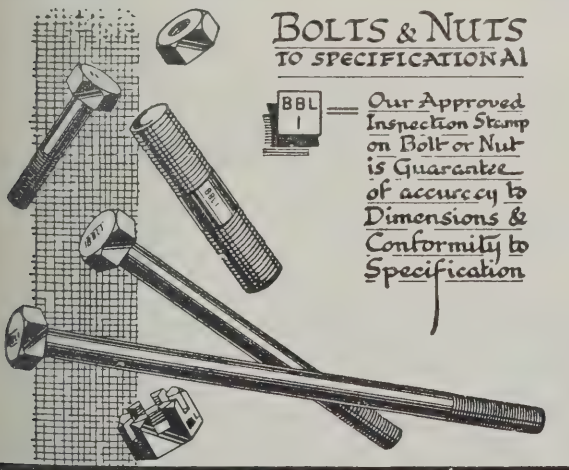

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MISCELLANEOUS ADVERTISEMENTS.

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Vol. XXXIV. No. 21. SIXPENCE WEEKLY.
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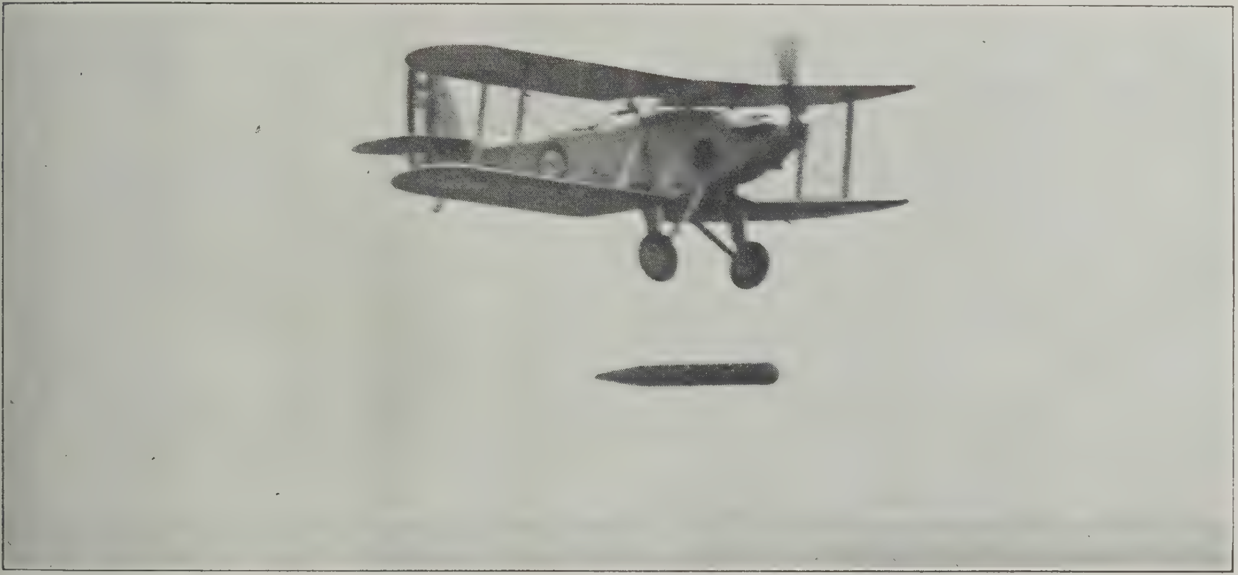
"SOME AIRY DEVIL HOVERS IN THE SKY AND POURS DOWN MISCHIEF."—(SHAKSPEARE—*King John.*)



DROPPING ITS STING:—The Blackburn Ripon II (Napier Lion engine) dropping a torpedo into the Humber on the occasion of a demonstration of Blackburn Aircraft at Brough, Yorkshire, on May 15.—(*"Aeroplane" photograph.*)

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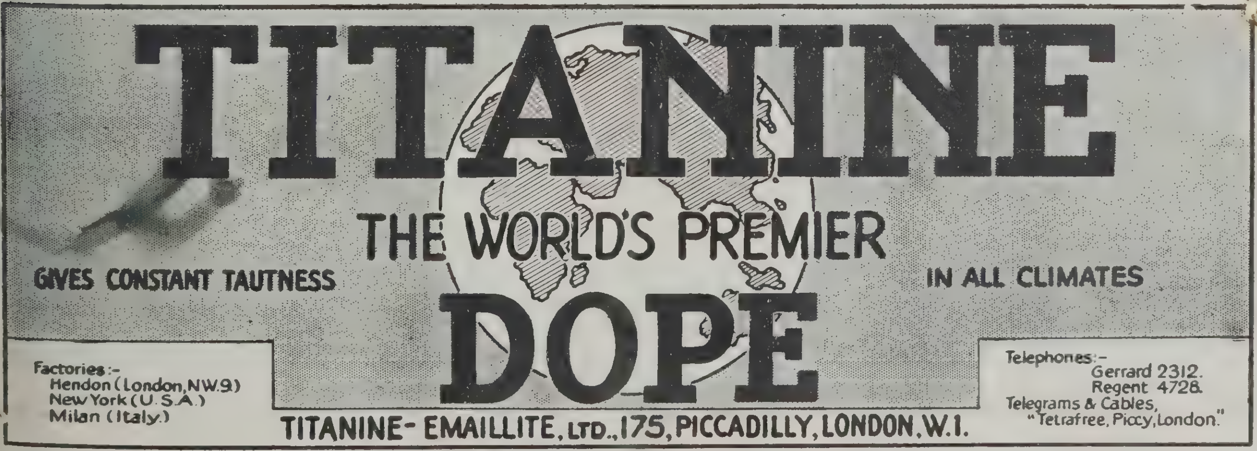

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THE AEROPLANE
Incorporating
Aeronautical Engineering

VOL. XXXIV
No. 21.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON FURTHER CONSIDERATIONS OF THE NEXT WAR.—II.

WHAT WE THINK WE HAVE LEARNED.

Just by way of showing how the human mind works from one war to another let us take a look at some of the things we thought we had learned in the past.

In the Sudan War against the Mahdi in the late 1890s the great Hamitic tribes, known to Thomas Atkins as "Fuzzies," who were the backbone of the enemy armies, cut up our cavalry by dropping under the horses and stabbing upwards. So our cavalry went into action in the Boer War of 1899 with their front ranks armed with lances—assuming that Brother Boer would lie on the ground to be pig-stuck. But the Boers never came within sticking distance, and picked off our cavalry with rifles at a couple of thousand yards.

That taught us the value of mounted infantry, so that, as Kipling wrote, "we fawned on the younger nations for men who could shoot and ride." And after the South African show was over we started in seriously to teach our infantry to shoot and our cavalry to use carbines—or, rather, short rifles.

Which was very useful in the early stages of the War 1914-18, for during the retreat from Mons to Paris the excellent shooting of small British detachments often held up the advance of far bigger German forces. In fact, though the British Army was practically without machine-guns, the enemy thought that we had a goodly supply of them simply because of their heavy casualties.

But when we settled down to trench warfare we found that our good rifle-shooting was of little use—and that machine-guns were the only things which would stop an enemy attack in force. The result is that to-day the allowance of rifle-ammunition in the Army is hardly enough to foul a rifle-barrel in a year's shooting, and every branch of the Army is being loaded up with machine-guns—which apparently are to be used like hoses, so that skilled marksmanship is at a discount.

Also, because the cavalry never had a chance on the West Front, we have abolished our historic horse-regiments entirely, or else we have amalgamated two regiments into one, or else we have taken away their horses and turned them into regiments of armoured cars bristling with machine-guns. And all this has been done regardless of the fine work done by cavalry in Mesopotamia and in Palestine—in which latter area the cavalry raid up the coast put the finishing touch to the Turkish downfall.

Furthermore, because the tanks did rather good work in the later stages of the War in France, after their development had been held up for two years by intrigue and jealousy, and after they had failed miserably at the first attempt through being used improperly and prematurely, some of the highest officers of the Army have now gone mad on tanks and regard them as the real Hereward, or guardian of the Army, in any possible next war. In fact some enthusiastic mechanical soldiers seem to look on tanks as the Army, the whole Army, and nothing but the Army.

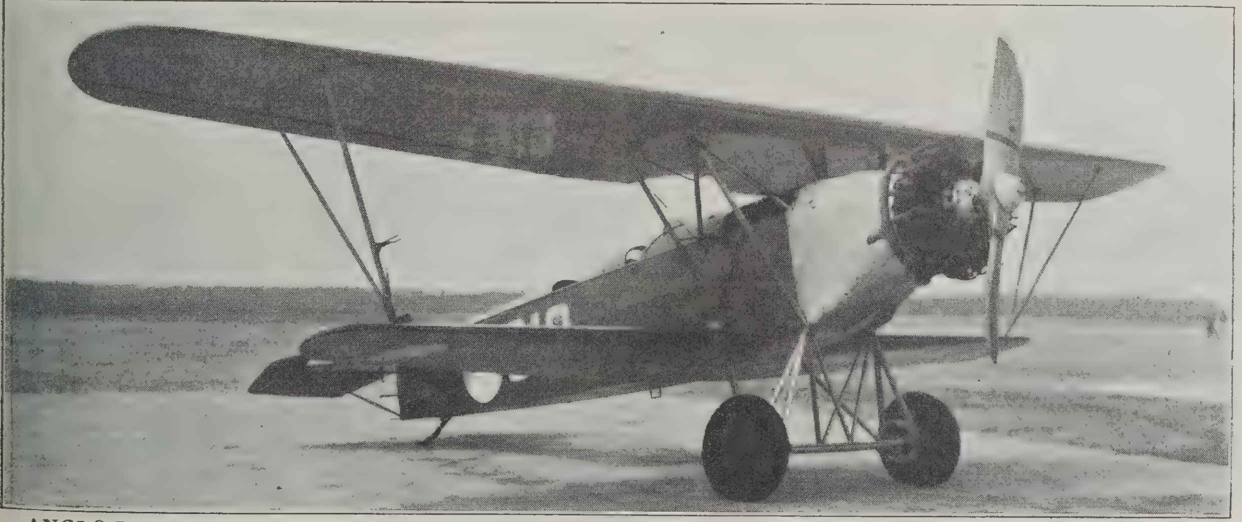
TANKOMANIA

Nobody can accuse one of being hostile to tanks, for, during the War 1914-18 the cause of the tanks was upheld in THE AEROPLANE nearly as strongly as was the cause of adequate aeroplanes for the Flying Services—and that at a time when the present loudest advocates of tanks knew less about them than did our friends the enemy. General-arrangement drawings for tanks of the type which ultimately went into action in September 1916 were actually in THE AEROPLANE office in October 1914, and for the whole of those two years one did one's utmost to stir up interest in them among the people who mattered—knowing, as one did, that tanks, if properly built and properly used in adequate numbers, could break the German trench-line at any point at any time.

When the tanks did come into action they were so undeveloped that only a small proportion of them ever reached the enemy's lines, because they broke down owing to mechanical defects. And they were pushed into the war in such small numbers that they merely gave the enemy premature warning of what to expect. The result was the production of special anti-tank guns—and the quaint situation, just before the Armistice, of five British tanks, captured by the Germans and used in a counter-attack against our advance, all being put out of action by a New Zealand Lieut.-Colonel with one anti-tank gun, which he had captured from the Germans.

The net result of the War 1914-18, so far as ground-fighting is concerned, seems to be that we have come to the conclusion that cavalry are quite useless; that infantry need not know how to use rifles because they will only be used as a police-force, or holding-force, armed with machine-guns, in captured enemy territory; and that all serious fighting on the ground will be done by the assorted varieties of tanks and armoured cars.

This conclusion appears to have been confirmed by experience during the Army Exercises last year, when a force of infantry and cavalry, stationed in country where tanks could not operate, tried to get across open country to another tank-proof area and were caught and cut up (in theory) by tanks and armoured cars before they could cover



ANGLO-DUTCH.—A Fokker C-VI two-seat reconnaissance biplane fitted with an Armstrong-Siddeley supercharged Jaguar engine.

the distance between. Under the existing conditions the lesson was obvious.

But our faith in tanks might have been firmer if the High Authorities had adopted the subtle suggestion made by a writer in *The Army, Navy, and Air Force Gazette* to the effect that instead of chewing up the English agricultural countryside the tanks might try more extended manœuvres over unoccupied Scottish grouse-moors or deer-forests—this he said knowing full well that not a tank exists which could get as far as Scotland under its own power, or, at any rate, knowing that if the power-plant held out the caterpillar tracks and the driving mechanism would not.

WAR-LESSONS IN AIRCRAFT.

Where aircraft are concerned we seem to have learned our lessons in much the same way. Everything we are doing—judging by the lines of development of recent Service types—is based on the assumption that the next war is going to be just like the last.

Apparently we are getting ready to fight a nation which has an Air Force equipped with machines just like those used by our friends the Germans in 1918, but with performances somewhere between 10% and 20% better. And the nation which we are to fight depends for its fightfulness on densely-populated national nerve-centres about 200 miles away from the particular bases from which our Air Force will be operating.

Because the German Gothas scared us stiff, we have built big night-bombers, which carry a bigger load of bombs than did the Gothas but are little if any faster. They might be quite useful for bombing at night enemy cities (or army assembly-points, or ammunition dumps) not more than 200 miles away. But, for bombing at any considerable range in windy weather, they would have to leave yesterday so as to get there to-morrow, and they would certainly be caught in daylight over enemy territory on their way home.

What use they would be against a country like Russia Heaven knows, even if we were operating from aerodromes on the German-Russian frontier. None of the Russian centres of munition-production could be reached by slow-flying night-bombers. And against a Russian army advancing through Rumania and Hungary—consisting, as it would, of hordes of light cavalry, without supply-trains, other than those needed for ammunition, and living on the country as they went along—big bombers would be useless.

ALTITUDE FIGHTERS.

Also, because Gothas scared us, we have built defensive single-seat fighters which can reach an enormous height but are no faster than certain single-engined high-speed day-bombers which we ourselves and other nations have produced.

Precisely what use the high-altitude interceptor-fighters would be against an enemy well equipped with modern machines is rather difficult to see. If the enemy had high-speed day-bombers of the class of the De Havilland Hound and the Fairey III.F with the special Napier engine, the high-altitude machines could never catch them on the level. And the bombers would be so far below the best height of the fighters that unless they happened to fly right under a fighter formation the fighters would never even catch them by diving on them.

Also, if the bombers were escorted by really high-speed fighters, as they should be, all that the high-altitude interceptor machines could do would be to climb out of the way and thence, as the old tag has it, "gaze with derision upon their baffled pursuers."

Personally, one has never been able to see any particular object in making machines for immense heights. So long as an aeroplane, whether a fighter or a bomber, can get up high enough to be a poor target for an anti-aircraft gun, it had much better be designed for very high speed and manœuvrability than for fighting under purely artificial conditions where the engine has to be supercharged with rarified air and where the pilot has to be fed with oxygen.

DAY-BOMBERS AND OTHERS.

Our high-speed day-bombers are also in a way a lesson from the last War. But they appear to be a development along useful lines. They actually are the lineal descendants of the D.H.4 and the D.H.9 and the D.H.9a, which were used at one time or another for daylight bomb-raids on junctions and ammunition dumps at a considerable distance behind the fixed trench line. They were also used by the Independent Force, R.A.F., in the later days of the War, for raiding German munition centres, which, unfortunately for Germany, were situated near her Western Frontier instead of being right in the heart of the country, where we could not have reached them.

Another relic of the last War is the idea that we need a special class of machine for Army Co-operation. None will deny that for Army co-operation work as it is done at present the Bristol Fighter of 1917 is wholly admirable,—especially when fitted with slot control to stop spinning nose-dives. But there seems no particular reason why that class of machine should be inherently different, except in its equipment, from the high-speed day-bomber. In these days of slots, not only for lateral control but for maintaining lift below what would normally be the stalling point, high-speed machines can be made to fly as slowly as slow machines. Therefore this class of machine might well be abolished as a class.

GENERAL PURPOSES MACHINES.

The last class of war-machine, which is a development of a survival of 1918, is that which we call the General Purposes machine. This is represented by the old D.H.9a, with the Liberty engine, the new Westland Wapiti with the Jupiter engine, and the Fairey III.F with the standard Napier. This class seems to have been developed for use against enemies who have no aircraft of their own, or at any rate, have no high-speed fighters which are up to the most modern standard.

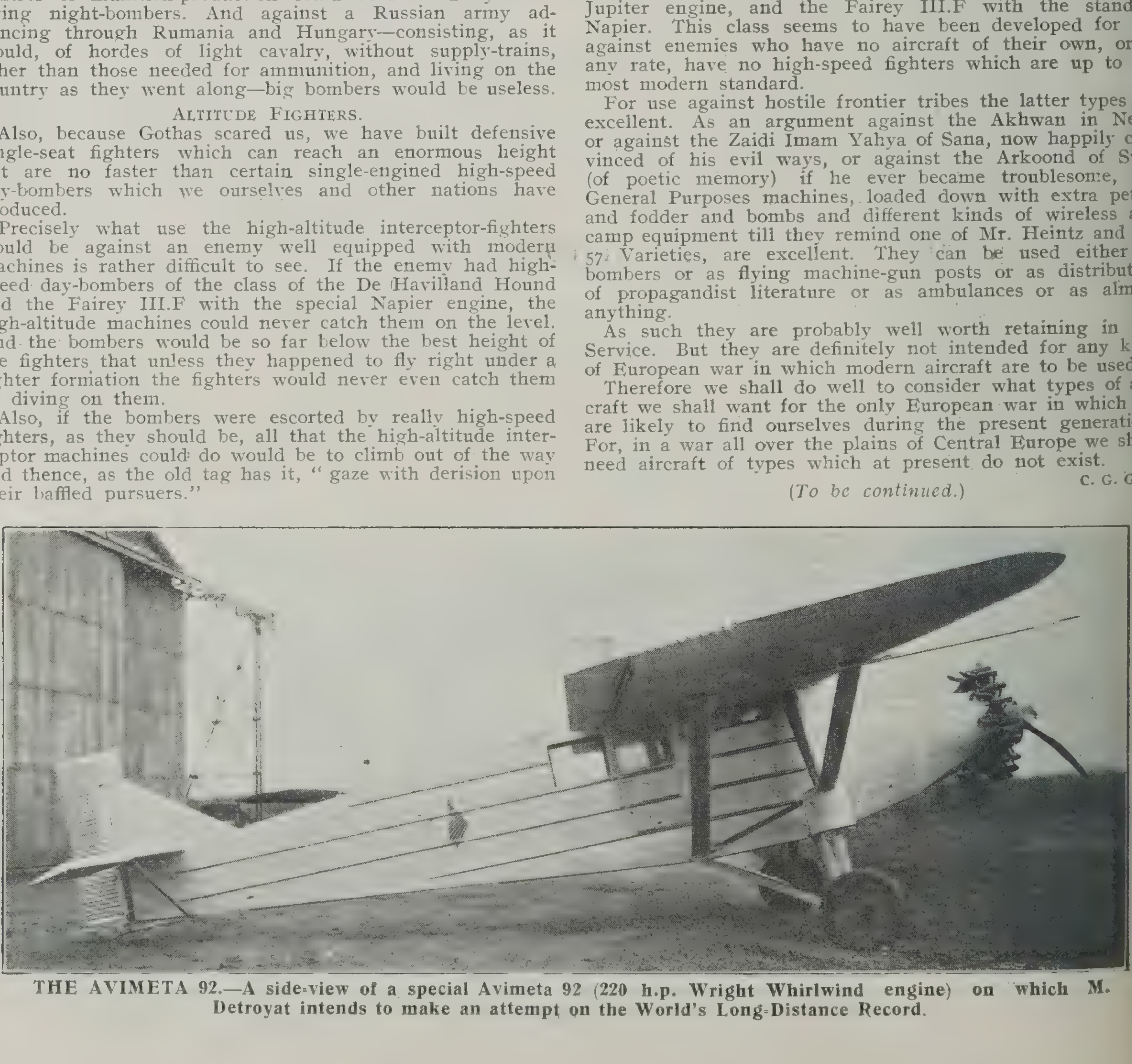
For use against hostile frontier tribes the latter types are excellent. As an argument against the Akhwan in Nejd, or against the Zaidi Imam Yahya of Sana, now happily convinced of his evil ways, or against the Arkoond of Swat (of poetic memory) if he ever became troublesome, our General Purposes machines, loaded down with extra petrol and fodder and bombs and different kinds of wireless and camp equipment till they remind one of Mr. Heintz and his 57 Varieties, are excellent. They can be used either as bombers or as flying machine-gun posts or as distributors of propagandist literature or as ambulances or as almost anything.

As such they are probably well worth retaining in the Service. But they are definitely not intended for any kind of European war in which modern aircraft are to be used.

Therefore we shall do well to consider what types of aircraft we shall want for the only European war in which we are likely to find ourselves during the present generation. For, in a war all over the plains of Central Europe we shall need aircraft of types which at present do not exist.

C. G. G.

(To be continued.)



THE AVIMETA 92.—A side-view of a special Avimeta 92 (220 h.p. Wright Whirlwind engine) on which M. Detroyat intends to make an attempt on the World's Long-Distance Record.

Reliability!

"... it is as well to remember that Napier Lions in the R.A.F. have often run 400 hours without overhaul."

Aeroplane, 18/4/28.

Four hundred hours without overhaul! Equivalent to 40,000 miles in the air. No other engine of such high power gives this service.

These were not specially selected engines. They were ordinary standard Napiers similar to those used by Imperial Airways on their Continental services, as used by the R.A.F. on their successful Cairo to Cape Town and back flights in three consecutive years (Fairey-Napier aircraft), and those now engaged on the flight from England to Australia (Supermarine-Napier flying boats).

When you buy Napier engines you are purchasing engines which, properly maintained, will give *you* this service, this same remarkably consistent reliability.

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THE AVRO BANQUET.

Readers of The Aeroplane are again reminded that a Banquet in honour of Mr. A. V. Roe will be given at the Savoy Hotel on Friday, June 8, by the R.Ae.S., the R.Ae.C., the A.L.B.E. and the S.B.A.C. The Chair will be taken by Sir Charles Cheers Wakefield, Bart., C.M.G.

There will be only two speeches, one by Sir Charles Wakefield paying tribute to Mr. Roe, and one by Mr. Roe in reply. His Royal Highness the Duke of York, patron of the R.Ae.S., has graciously consented to honour the gathering with his presence after the Banquet. When the proceedings are over those who so wish may dance.

Tickets are one guinea each, including the dance but exclusive of wines, and can be obtained only from The Secretary, The Royal Aeronautical Society, 7, Albemarle Street, London, W.1.

In this connection one is extremely pleased to be able to correct a misstatement made in the announcement of this banquet last week. Mr. A. V. Roe's father, Dr. Roe, of Putney, is, happily, still alive and well at the age of 85, and is living with Mr. and Mrs. A. V. Roe at Hamble.

One also wishes to correct the statement that this is the 21st anniversary of Mr. Roe's first flight. The figure should have been the 20th. Mr. Roe and Mr. Cody were both trying to get their machines into the air during the early part of 1908, though in fact they were both building their machines in 1907.

A NEW POWER IN AVIATION.

Those who are beginning to realise the need for the proper organisation of air touring will be glad to hear that the Automobile Association will probably shortly be taking a hand in the game. Practically every aviator is also a car-owner, and any car-owner who is not a member of the Automobile Association ought not to be allowed to have a car. Consequently, whatever the A.A. does for air tourists will actually be done for those who are already members of the Association.

One of the first tasks to be undertaken will be the getting together of a complete list of aerodromes and possible landing grounds in this country. Which is badly needed.

Over and above the recognised permanent aerodromes licensed by the Air Ministry there have been from time to time hundreds of fields temporarily licensed for use by joy-ride firms. And many of them are in places where they would be convenient for tourists, as well as being useful as emergency landing-grounds.

Some of them are now being used for agriculture. In other instances, though the fields may still be under grass, the owners may be unwilling to allow casual aviators to use them, even for a landing fee. And others again, though licensed for use by skilled joy-ride pilots, may be unsuitable for newly-qualified private owners.

One gathers that the idea is to make a list of all such grounds, to find out through the local A.A. Scout Patrol whether the owners of the grounds will allow them to be used as landing grounds by air tourists, and then to have such as may be available inspected by some qualified aeronautical person who will say whether they are fit for use or not.

When once such a list has been made, each ground can be inspected at frequent intervals by the nearest A.A. Scout, who can report to Headquarters at Fanum House, New Coventry Street, W.1, whether the ground is still available and whether any alteration has been made to it.

In addition, the A.A. may endeavour to interest the numerous hotel proprietors whose premises are approved by the A.A. in discovering possible landing grounds near their towns, with the idea of attracting air tourists.

There is also a proposal that such hotel proprietors as may be interested will receive from A.A. Headquarters daily weather-reports and forecasts which will show not only to air tourists but to motor tourists the prospective weather in whatever direction they may be going.

There are numerous other ways in which the immense existing organisation of the A.A. may be used for the benefit of air tourists, and we may be sure that whatever the Association undertakes will be done with that high efficiency which has marked all its doings in the past. And the energy for which the secretary of the Association, Major Stenson Cooke, is famous, should prove a most valuable asset to the development of Civil Aviation in this country.

There are doubtless those who consider that such work as this ought to be done by the Royal Aero Club. One would, however, point out that the R.Ae.C. has neither the money nor the organisation to undertake such work. The Aero Club is primarily the governing body of sporting flying in this country, using the phrase sporting flying in the sense of competition flying. Thus the position may well be that the Automobile Association will do for the air tourist precisely what it does for the motor tourist, and that the Royal Aero Club will continue to govern, or misgovern, competitions and will remain a social club, and its relations to the A.A. may be very much those of the Royal Automobile Club to the same Association.—C. G. G.

A CENTRAL LONDON AIR STATION.

The following letter appeared in *The Times* on May 17:—

Sir,—Those who had experience with the Air Force during the War will agree with Sir Sefton Brancker in his statement that "an aerodrome in the middle of London is going to be a vital necessity in the future," and when Colonel Lockwood Marsh writes about Sir Sefton trying to make our flesh creep he is dealing with Sir Sefton's proposals in exactly the same way as short-sighted people dealt with Lord Roberts's speeches on the danger of war in 1914.

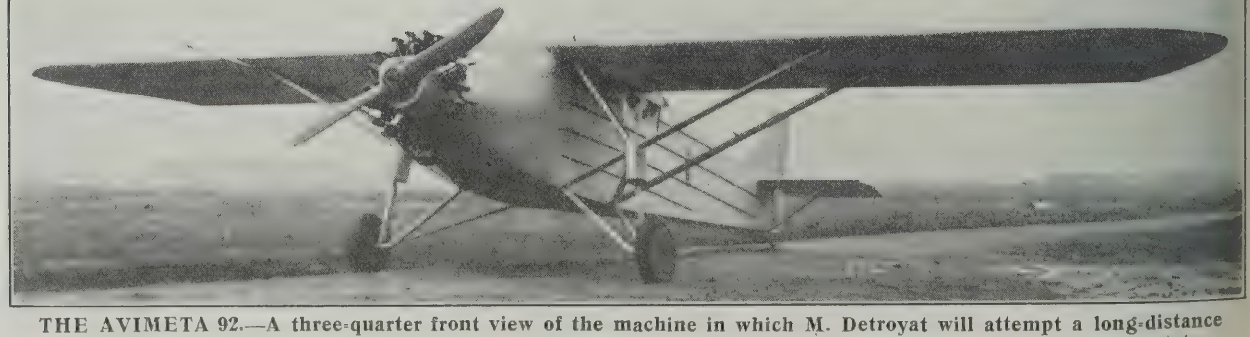
I should like, however, to point out that the Westminster City Council in 1922 were considering this subject, and their General Purposes Committee reported that, as the matter of a central air station affected not only the City of Westminster, but London as a whole, it should be considered by the Metropolitan Borough Councils Standing Joint Committee as representative of all the metropolitan boroughs. The council on January 25, 1925, on the recommendation of the committee, referred the matter to the Standing Joint Committee for their consideration. It is believed that the Westminster City Council, who have taken the initiative in the matter, are now moving again, and I venture to suggest that this important problem of a conveniently situated air station for London might be considered together with the other problem of playing grounds for poor children. I suggest, not that Hyde Park should be taken, but that a short Act of Parliament should be passed enabling Battersea Park to be taken and converted into an air station, and that the money for this purpose should be contributed by the metropolitan boroughs, added to a substantial contribution from the State, and that this money should be used for the purpose of acquiring existing squares and properties in the neighbourhood of such squares, which could be converted into open spaces suitable for playing grounds. I shall not take up your space by going into the matter in detail, but I have satisfied myself, and very little investigation will, I think, satisfy others, that the scheme will not be a very expensive one.

The main objection has been that Battersea Park is not large enough for the purpose; but I would point out that my suggestion is not that there would be an aerodrome capable of housing large aeroplanes, which means hangars, workshops, etc., but that it should be an air station from which aeroplanes would fly to the various aerodromes round London. Those who have witnessed the latest experience of flying from the decks of battleships will not consider that Battersea Park is too small a space.

Your obedient servant,
P. Harrington Edwards.

33, Southampton Street, Strand, W.C.2.

[Mr. Harrington Edwards may be reckoned among the pioneers of aviation, for as far back as 1910 he elaborated a quite workable scheme for establishing air stations at important points all over England. His latest suggestion deserves consideration, though one would prefer Clapham Common to Battersea Park, because it is on a hill instead of in a hollow.—C. G. G.]



THE AVIMETA 92.—A three-quarter front view of the machine in which M. Detroyat will attempt a long-distance record attempt. Its similarity to the Ryan "Spirit of St. Louis" is striking, but unlike its American prototype it is constructed entirely of metal including the covering.

FAIREY

AIRCRAFT

THE ROYAL AIR FORCE.

The London Gazette.

May 15.

General Duties Branch.—Plt. Off. G. R. Weighill is promoted to the rank of Flg. Off. (April 10); W. G. L. Montagu-Douglas-Scott is granted a S.S. comn. as a Flt. Lt. for three years on the active list (May 1).

The following Flg. Offs. are transferred to the Reserve:—J. R. Pocock, Class A (May 14); C. R. Troup, Class C (May 7). The following resign their S.S. comns.:—Flg. Off. (Hon. Flt. Lt.) W. B. O. Fox (May 4); Flg. Off. L. A. Walsh (May 16).

Stores Branch.—Plt. Off. J. E. Welman is promoted to the rank of Flg. Off. (April 10).

Accountant Branch.—Plt. Off. on probation H. C. Bakes is confirmed in rank and promoted to the rank of Flg. Off. (Dec. 4, 1927).

Medical Branch.—The following are granted perm. comns. in the ranks stated (May 16):—Flt. Lt. F. B. C. L. B. Crawford, M.B.; Flt. Lt. R. G. Freeman. Flt. Lt. T. Sheehan relinquishes his temp. comn. on completion of service, and is permitted to retain his rank (April 29). (Substituted for the notification in the *Gazette* of May 8.)

Reserve of Air Force Officers.—General Duties Branch.—The following are granted comns. in Class A.A. (ii) as Plt. Offs. on probation:—G. R. De Havilland (April 30); H. D. Hinde, E. P. Swallow (May 2). Flg. Off. H. L. Taylor relinquishes his comn. on completion of service (Dec. 2, 1927).

Auxiliary Air Force.—General Duties Branch.—No. 602 City of Glasgow (Bombing) Squadron.—The following to be Plt. Off.:—R. Faulds (April 5).

Appointments.

Week ending May 21.

General Duties Branch.—Wing Commander T. E. B. Howe, A.F.C., to R.A.F. Station, Northolt, to command, 15/5.

Squadron Leaders A. H. Peck, D.S.O., M.C., to No. 55 Sqdn., 'Iraq, 25/4. J. J. Breen, to Armoured Car Wing, 'Iraq, 9/4.

Flight Lieutenants O. R. Gayford, D.F.C., to Station H.Q., Heliopolis, 10/5. H. L. P. Lester, to No. 14 Sqdn., Amman, 1/5. W. G. L. Montagu-Douglas-Scott, to H.Q., 'Iraq, 11/5. E. S. Borthwick-Clarke, to H.Q., Aden Command, 4/5. V. P. Feather, to Home Aircraft Depot, Henlow, 7/5. J. R. Wolley and C. W. Weedon, to R.A.F. Depot, Uxbridge, 6/4. F. W. Sinclair, D.F.C., to R.A.F. Depot, Uxbridge, 31/3.

Flying Officers D. C. Burnley and C. N. A. B. Mumby, to R.A.F. Depot, Uxbridge, 6/4. C. F. Steventon, to R.A.F. Depot, Uxbridge, 13/4. J. H. Woodin, to H.Q., Middle East, 10/5. W. E. Gray, to Station H.Q., Heliopolis, 16/4. A. N. Francombe, to Aircraft Park, India, 9/4. R. A. Barnett, to Aircraft Depot, India, instead of to No. 31 Sqdn., as previously notified, 23/3. J. C. Cunningham, to Aircraft Depot, India, instead of to No. 20 Sqdn., as previously notified, 23/3.

Pilot Officers I. McL. Cameron and J. H. Lindell, to No. 7 Sqdn., Worthy Down, 2/5. C. R. Clarke and G. E. Klein, to No. 10 Sqdn., Upper Heyford, 2/5. J. F. McKenna, to No. 99 Sqdn., Upper Heyford, 2/5. D. T. Saville, to No. 17 Sqdn., Upavon, 2/5. J. F. Griffiths, to Aircraft Depot, India, instead of to No. 28 Sqdn., as previously notified, 23/3. J. Addison, D. A. L. Campbell, H. H. Chapman, P. L. M. C. Deacon, J. W. Hawke, F. R. Jones, W. H. Jones, H. Kerr, H. D. McGregor, G. F. MacPherson, R. G. Whalley, E. S. Whitaker, H. J. A. Williams, F. R. Balfour, C. G. Davies, E. L. Johnstone and M. N. Oxford, to No. 3 F.T.S., Grantham, 30/4.

Medical Branch.—Flight Lieutenant G. S. Strachan, M.B., to No. 28 Sqdn., India, instead of to H.Q., India, as previously notified, 13/4.

Flying Officers J. E. Foran, M.B., to No. 8 Sqdn., Aden, 1/5. J. J. Quinlan, M.B., to R.A.F. Station, Donibristle, 15/5. J. H. Cullinan, T. A. Edwards, M.B., A. R. French, P. J. Nyhan, M.B., B. A. Porritt, M.B., to Medical Training Depot, Halton, on appointment to S.S. Comns., 2/5.

Stores Branch.—Wing Commander W. J. Shields, to No. 1 Stores Depot, Kidbrooke, 7/5.

Flight Lieutenant P. J. Murphy, to R.A.F. Depot, Uxbridge, 31/3.

Flying Officers J. H. P. Clarke and F. A. R. Smith, to R.A.F. Depot, Uxbridge, 6/4. R. G. A. Vallance, to No. 2 Wing H.Q., India, 3/4.

Accountant Branch.—Flight Lieutenants J. Sullivan, to Home Aircraft Depot, Henlow, 10/5. W. W. Deane, to R.A.F. Station, Tangmere, 22/5.

Fatal Accident.

The Air Ministry regrets to announce that Flg. Off. Geoffrey Bradbury died in hospital on May 20, as the result of an accident on May 8, at Holbeach Ranges to a Siskin machine of No. 41 (Fighter) Squadron, Sutton Bridge. Flg. Off. Bradbury was the pilot and sole occupant of the aircraft.

The Far-East Cruise.

The Service cruise of four Supermarine Southampton flying-boats (Napier Lion engines), under the command of Group Capt. Cave-Browne-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17 and arrived at Singapore on Feb. 28, began the second part of the cruise on May 21, when they left Singapore and arrived at Klabat Bay, Banka Island.

The New Promotion Scheme.

Air Ministry weekly orders contain an amendment to the scheme for promotion in the seniority list by a system of antedates, as described in The Aeroplane of March 7, and now make provision for flying instructors with the rank of Flight Lieutenant, who had hitherto not received enough recognition in the new scheme. Flight Lieutenants who are qualified as Flying Instructors, Grade A, can now secure an antedate on the list up to 12 months, and Flying Instructors, Grade B, can receive antedates up to six months.

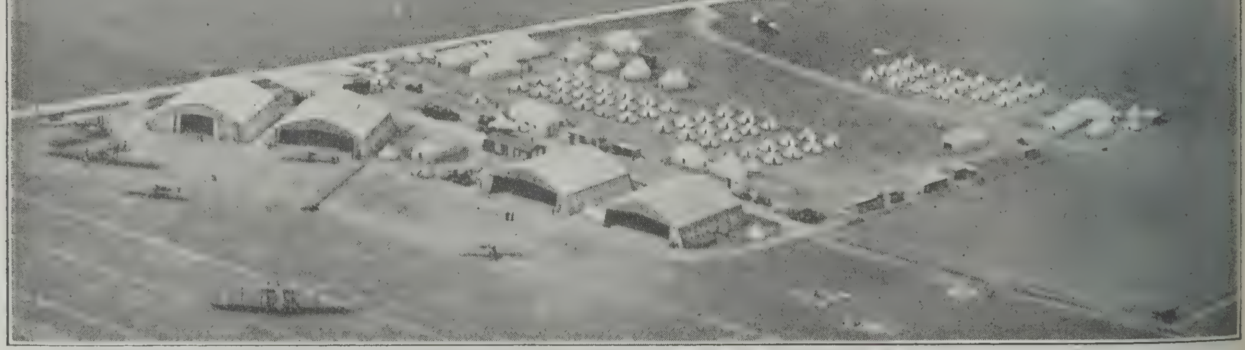
Officers who have already received an antedate for promotion to Flight Lieutenant by reason of one of these qualifications will not receive an antedate for promotion to Squadron Leader unless, since being promoted Flight Lieutenant, they have been reclassified from Grade B to Grade A, when the antedate will be six months.

The claims of officers who qualified as Flying Instructors before the existing C.F.S. categories were introduced will be considered individually by the Air Council.

Liaison with the Public Schools.

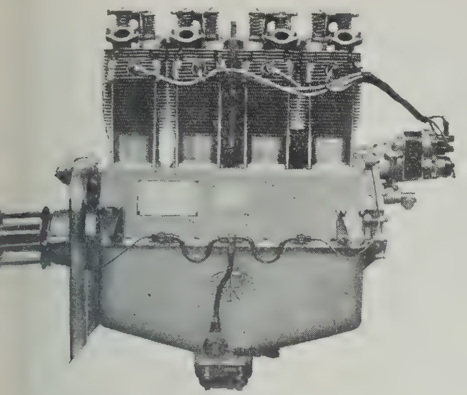
A system of liaison between the R.A.F. and the Public Schools was begun as an experimental measure a few years ago and within its limits has proved a success.

The duties of the R.A.F. liaison officers are to keep in close touch with the officer commanding the School O.T.C., or such representative as the school may desire, and to arrange for occasional lectures on subjects connected with the R.A.F. and with aeronautics. Under suitable conditions the Liaison Officer arranges for co-operation by the R.A.F. in O.T.C. Field Days. He also supplies the school authorities and any of the boys who are interested, with statistics about the Air Force and lends them any diagrams and photographs of interest.



A PRACTICE CAMP.—The R.A.F. Practice Camp at Weston Zoyland, Somerset. The photograph shows machines of No. 7 (Bombing) Squadron on the ground and was taken from a machine of the same Squadron. This camp is operated every Summer and the ranges were re-opened for bombing and firing on April 26.

(R.A.F. Official photograph.)



30/80 h.p. A.D.C. "Cirrus."

TWO "CIRRUS" ARRIVALS from SOUTH AFRICA

LT. R. R. BENTLEY, A.F.C.
("CIRRUS MOTH.")

LADY HEATH.
("CIRRUS AVIAN.")

Lt. R. R. Bentley, A.F.C., flying a "CIRRUS MOTH" Light Aeroplane, arrived at Croydon May 12, after having flown from South Africa with a passenger.

He is the first pilot to make the return flight LONDON—CAPETOWN—LONDON and also the first to do the journey in either direction on a light aeroplane with a passenger.

Lady Heath arrived at Croydon May 17th on a "Cirrus Avian," having flown solo from South Africa. This is the first time a lady pilot has flown from Capetown to England.

These flights must be added to the lengthy list of "Cirrus" successes.

OUTSTANDING "CIRRUS" ACHIEVEMENTS.

ENGLAND—AUSTRALIA (16 days, solo).
ENGLAND—AUSTRALIA (with passenger).
LONDON—CAPETOWN (solo, lady pilot).
1st, KING'S CUP AIR RACE 1926.
1st, KING'S CUP AIR RACE, 1927.
BRITANNIA TROPHY, 1927.

CIRRUS Engines have been supplied under contract to the British Air Ministry, are in use by 30 Light Aeroplane Clubs, and have been supplied to 25 different Countries.

CIRRUS Engines are fitted in the following Light Aeroplanes :—
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BLACKBURN "BLUEBIRD." SHORT "MUSSEL" (Light Seaplane).
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Another duty of the Liaison Officer is to arrange for occasional visits by parties from the school to R.A.F. Stations, where selected boys who are considering entering the R.A.F. may, with the written permission of their parents and subject to the exigencies of the Service, be taken for flights as passengers. Stunting is forbidden.

The Liaison Officers at the various Public Schools at present are as follows :—*Charterhouse,* Group Capt. N. D. K. MacEwen and Sq. Ldr. A. S. C. S. MacLaren; *Cheltenham,* Flt. Lt. F. J. W. Mellersh; *Clifton,* Wing Cdr. E. M. Murray; *Eton,* Wing Cdr. B. E. Sutton and Flg. Off. A. H. Wheeler; *Haileybury,* Sq. Ldr. J. C. Slessor; *Harrow,* Sq. Ldr. P. Huskinson; *Lancing,* Sq. Ldr. H. F. A. Gordon; *Marlborough,* Sq. Ldr. H. K. Thorold; *Rugby,* Flt. Lt. G. C. Gardiner and Flt. Lt. F. F. Inglis; *Stowe,* Sq. Ldr. W. A. Coryton; *Wellington,* Flg. Off. H. R. D. Waghorn; *Winchester,* Flt. Lt. D. W. F. Bonham-Carter.

Temporary Stations.

No. 13 (Army Co-operation) Squadron is temporarily located at Odiham, Hampshire.

The Coast Defence Co-operation Flight is temporarily located at Shoeburyness.

In connection with the R.A.F. Display a temporary R.A.F. Training Camp has been established at Hendon.

Sutton's Farm Renamed.

Owing to the resemblance between the names of the R.A.F. Practice Camp Sutton Bridge and the R.A.F. Station Sutton's Farm the latter has been renamed the R.A.F. Station, Hornchurch.

The postal address of the R.A.F. Station, Hornchurch, will be in future, Hornchurch, Essex, and the telephone number will be Rainham 143. No. 111 (Fighter) Squadron is stationed at Hornchurch.

Slots on Service Aircraft.

Sir Samuel Hoare in the House of Commons on May 16 stated that 80 Bristol Fighter machines had already been fitted with the slot apparatus and aircraft of this type were being modified at the rate of about six per week. A first delivery had been made of eight machines of another type with slots incorporated in the design, and contracts were being placed for the fitting of this device to two more types of aircraft. [The machine referred to is the Westland Wapiti (Jupiter engine).]

He thought that with one or two exceptions the device could be fitted to all R.A.F. machines and as far as he could see at present it did not interfere with the performance of the machine.

Wing Commander T. E. B. Howe.

Wing Cdr. T. E. B. Howe, A.F.C., whose appointment to command the R.A.F. Station, Northolt, is dated May 15, 1928, was born in 1886 at Hillsboro', Lisburn, Co. Down, Ireland, and was educated at Dover College. He enlisted in the 12th Infantry Battalion, Australian Imperial Forces, in October, 1914, and served with them until April, 1916, when he was appointed temporary probationary Flight Sub-Lieutenant in the R.N.A.S., and posted to the White City. In May, 1916, he went to Chingford and the following August he was appointed assistant instructor at Cranwell, then an R.N.A.S. Station. He was promoted Captain on the formation of the R.A.F., and in September, 1918, he was posted to No. 18 Squadron in France. He was awarded the Air Force Cross in November, 1918, in recognition of valuable flying services. After the Armistice he was appointed to command the Air Pilotage School, Andover. In the New Year Honours of 1923 he was awarded a Bar to the Air Force Cross, and on Jan. 15, 1923, he was appointed to command No. 11 Squadron at Andover. On Mar. 18, 1923, Major-General J. F. Gathorne Hardy, Director of Military Training, expressed appreciation of the very valuable assistance rendered by night flying at the School of Anti-Aircraft Defence at Perham Down by this officer. In May, 1923, he was appointed to command No. 32 Squadron at Kenley. In 1924 he successfully passed a course at the R.A.F. Staff College, Andover. In September, 1925, he was posted to the R.A.F. Unit in H.M.S. *Furious.* In 1926 he won the Dunning Memorial Cup.

A Special Appointment.

The London Gazette of May 15 contains the announcement of the appointment to a Short Service Commission, with the rank of Flight Lieutenant, for three years on the active list, of W. G. L. Montagu-Douglas-Scott.

Flt. Lt. Montagu-Douglas-Scott was born in 1870 and is a grandson of the 5th Duke of Buccleugh. He was formerly a Captain in the 1st Lovats' Scouts. His Short Service Commission in the R.A.F. is a special appointment and it is understood that he will be employed on intelligence duties in 'Iraq. He was posted to H.Q. 'Iraq on May 11.

The Groves Memorial Essay.

The prize-winners of the R. M. Groves Memorial Prize Essay competition for 1928 are as follows :—

First Prize (Books and £30), Wing Cdr. W. Sholto Douglas M.C., D.F.C., Fighting Area, Air Defence of Great Britain.

Second Prize (Books and £20), Flt. Lt. H. P. Lloyd, M.C., D.F.C., Headquarters, No. 23 Group, Inland Area.

Third Prize (Books and £10), Flt. Lt. W. M. Youl, Fighting Area, Air Defence of Great Britain.

A special prize of £10 for the most striking and original part of any individual essay other than those of the first and second prize-winners has been awarded to Sq. Ldr. P. B Hunter, No. 1 School of Technical Training (Apprentices) Halton.

The Cranwell Magazine.

The R.A.F. Cadet College Magazine, Spring, 1928. In the current issue of the Cranwell magazine Wing Cdr. W. Sholto Douglas concludes his series of articles on Air Fighting and discusses the War of 1914-18 from the Battle of Cambrai to the Armistice. He includes vivid descriptions of the Retreat in March, 1918, the offensive patrols of the Summer of 1918

ARMY CO-OPERATION IN EGYPT.—An air view of the Army camp at Mena during the Army and Air Force operations in 1927. The photograph was taken from a machine of No. 208 (Army Co-operation) Squadron, which is stationed at Heliopolis and commanded by Sq. Ldr. V. S. E. Lindop.

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and the Great Advance in the Autumn of 1918. He also gives a description of the various methods of destroying hostile balloons.

Flt. Lt. A. R. M. Rickards has contributed an account of a trip he and a companion made across Ethiopia on mule-back which is illustrated by four excellent photographs.

Three Cadets have described visits made by them to the Bristol Aeroplane Co. Ltd., A.D.C. Aircraft Ltd., and Short Brothers of Rochester, in the course of which they have mentioned names which must have caused a certain Department at the Air Ministry to squirm.

The L.A.D.A. Reunion.

The tenth anniversary dinner of the London Air Defence Area Club was held at May Fair Hotel on May 18 to celebrate the anniversary of the last air raid on London. The president, Maj.-Gen. E. B. Ashmore, was in the chair, and replied to the toast of The Club, which was proposed by Air Vice-Marshal Sir Robert Brooke-Popham. The toast of The Air Defences of Great Britain was proposed by Maj.-Gen. H. H. S. Knox, and replied to by Air Marshal Sir John Salmond.

Among those present were :—

Air Marshal Sir John Salmond, Lieut.-Gen. Sir Reginald Stephens, Maj.-Gen. C. A. Ker, Col. J. P. Moir, Lieut.-Gen. Sir Webb Gillman, Col. L. H. Queripel, Col. H. W. Hill, Air Vice-Marshal Sir John Steel, Col. A. F. Thomson, Air Commodore F. V. Holt, Lieut.-Col. S. Pleydell-Bouverie, Col. F. J. Marshall, Lieut.-Col. M. G. Bland, and Col. M. W. Emely (hon. secretary).

The Royal Tournament.

The Royal Tournament will be opened at Olympia on May 24 by Their Majesties the King and Queen.

Two performances will be given daily from May 24 until June 9, and will include a display of Physical Training Drill by the Royal Air Force.

ITALY—ITALIAN SOMALILAND.

On Apr. 5 a squadron of four Romeo Ro.-1 two-seat reconnaissance biplanes (450 h.p. Romeo-Jupiter engines) under the command of Major P. Bitossi, left Naples to fly to Mogadiscio, Italian Somaliland.

They flew by way of Milo, Cape Bon, Benghazi, Sollum, Tobruk, Cairo, Aswan, Atbara, and Khartum.

On May 15 when flying from Malakal to Mongalla they ran into a storm and lost their way. Three of the machines landed 30 miles south of Rejaf, which is 50 miles S. by S.W. of Mongalla and in landing one of the machines broke its airscrew.

One machine carrying a mechanic and a native headman in the back seat flew to Mongalla for food and help, and returned to Rejaf with the fourth machine which had lost touch with the other machines and had reached Mongalla. In the meantime an R.A.F. machine left Khartum with a new airscrew for Kosti, in the White Nile district, where a river mail steamer was intercepted and charged with the delivery of the spare.

THE ACCIDENT AT KHOMS.

Wing Cdr. Manning's accident at Khoms in North Africa so damaged his Westland Widgeon that he has gone on to Australia by boat rather than wait for the necessary repairs to be done. This would have meant sending the machine back to England.

One is glad to be able to report that the accident was not due to any defect either of the machine or the Cirrus engine. While in the act of landing Wing Cdr. Manning ran into a single telegraph wire and the resultant heavy drop to the ground broke the back of the machine.

A SPANISH LONG-DISTANCE ATTEMPT.

On May 11 Capt. Jimenez and Capt. Iglesias, of the Spanish Army, attempted to leave Tablada, near Seville, in a Spanish-built Breguet XIX biplane to attack the World's long-distance record. An obstruction caused them to swerve off their course, and after covering 1,000 yards they struck a motor-car. The consequent damage to one of their wings will cause a delay of several days before a fresh attempt can be made.

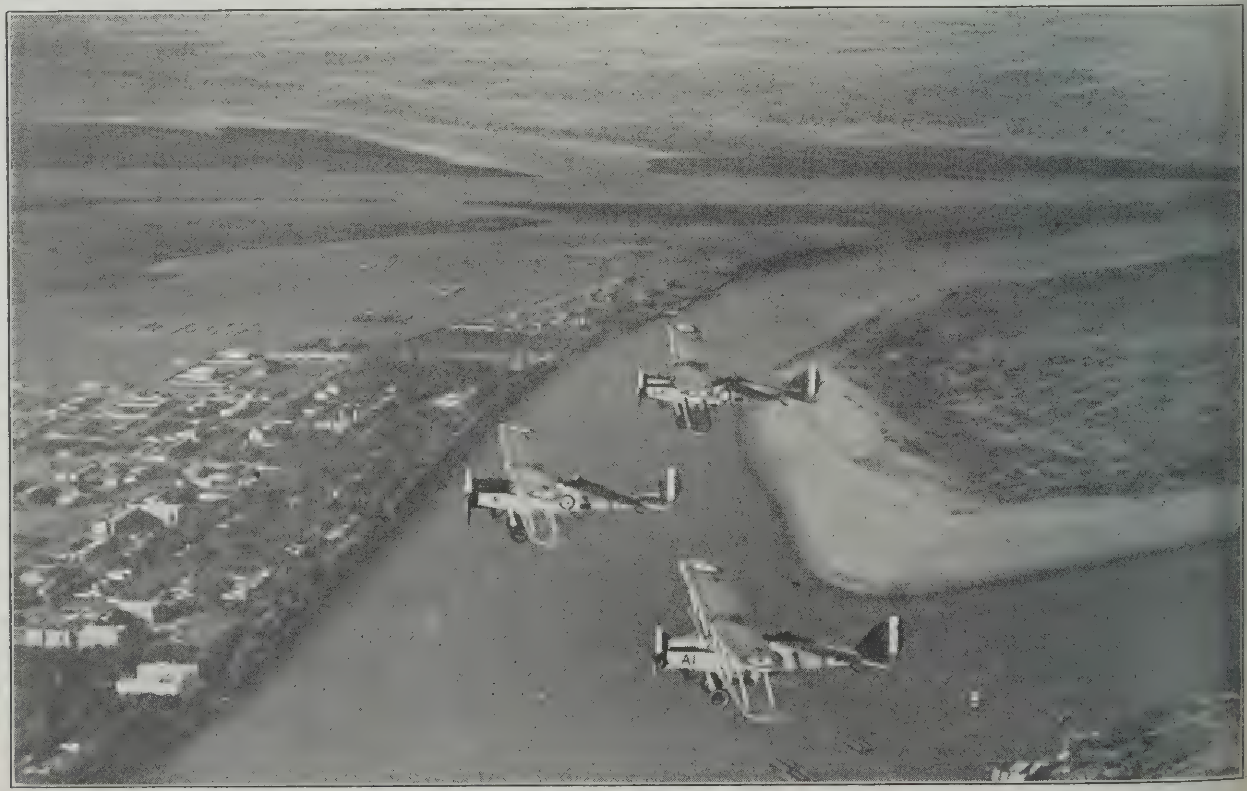
A BORDER INCIDENT.

On May 13 a Russian aeroplane crashed at Parachinar, about 90 miles W. of Peshawar. The two occupants, both Russians, were unhurt, but the machine was badly damaged.

The machine was one of a batch being delivered to Kabul, Afghanistan, but the pilots lost their way. The occupants were sent to Kohat and arrangements are being made by the British authorities for them to be sent on to Kabul.

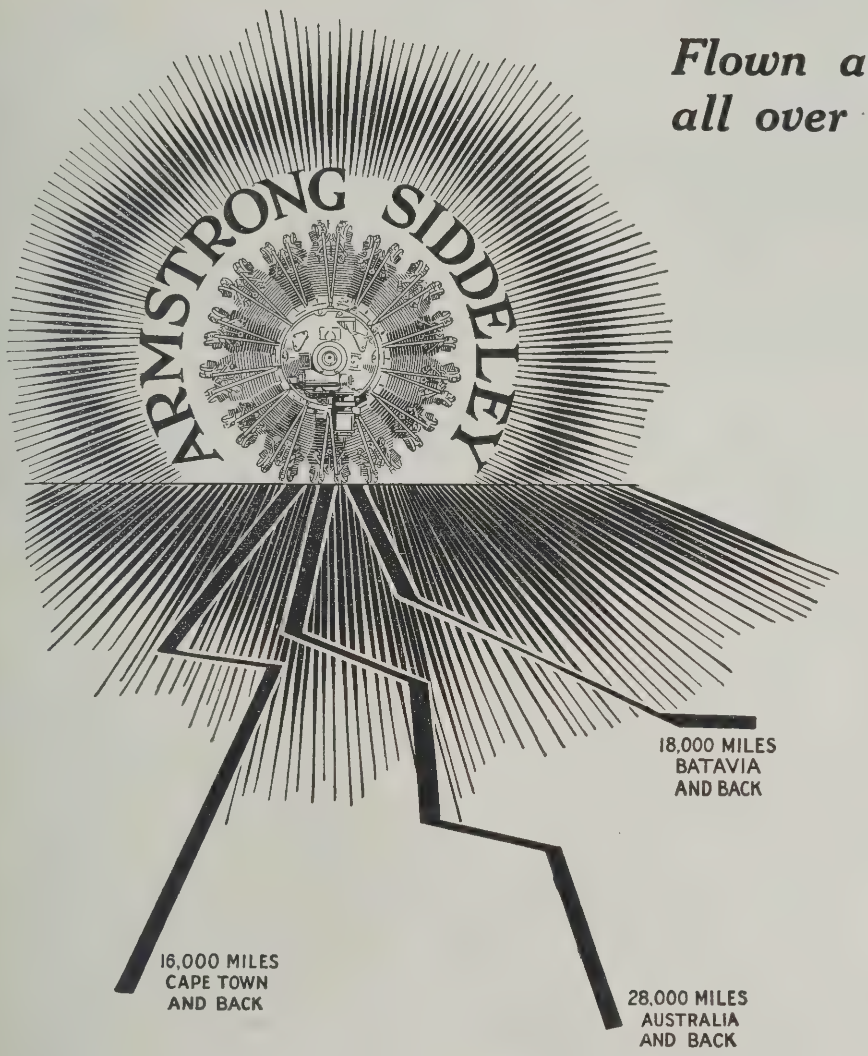
THE FIRST ITALIAN PILOT.

With regard to a point of Italian aeronautical history to which reference was made in The Aeroplane recently, Mr. John Jay Ide, of the American Advisory Committee for Aeronautics, writes to point out that in fact the first Italian aviator was Lieutenant Mario Calderara, of the Italian Navy, who was taught to fly by Mr. Wilbur Wright in the Winter of 1908-09. Lieut. Savoia was a pupil of Lieut. Calderara, and Lieut. Guidoni, as he then was, learned to fly at about the same time.



THE JUNCTION OF THE RIVERS.—A formation of D.H.9as of No. 47 (Bombing) Squadron, R.A.F., flying over the Nile. In the background may be seen the junction of the White Nile and the Blue Nile. No. 47 (Bombing) Squadron is stationed at Khartum.—*(R.A.F. Official photograph.)*

Flown and known all over the World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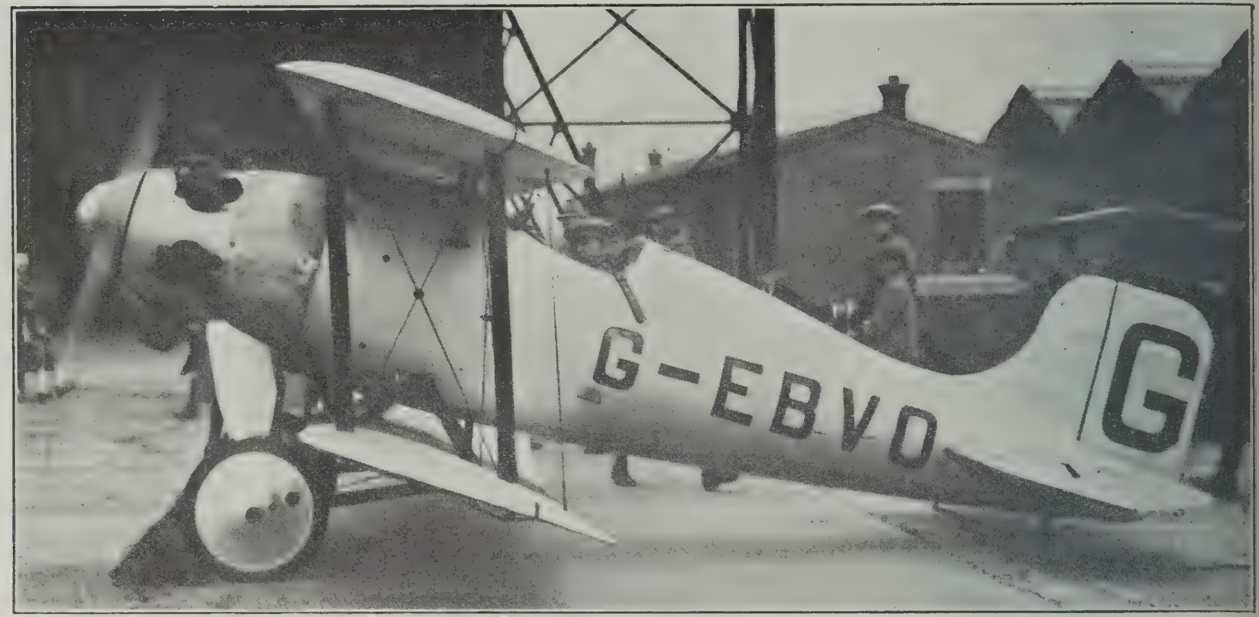
A DEMONSTRATION AT BROUGH.



THE BLACKBURN LYNCOCK.—**A high-performance single-seat light fighter fitted with the 230 h.p. Armstrong-Siddeley Lynx engine. The performance of this machine is equal to the majority of Service single-seat fighters, although possessing half their horse-power.**—(*" Aeroplane " photograph.*)

A large party, which included Air Commodore A. M. Longmore, C.B., D.S.O., Director of Equipment; Group Captain J. A. Chamier, C.B., C.M.G., D.S.O., O.B.E., Director of Technical Development, and Mr. C. R. Brigstocke, C.B., Director of Contracts, all of the Air Ministry; the Air and/or Naval and Military Attachés in London of nearly twenty foreign Powers, and a large number of representatives of the Press, visited the Brough works of the Blackburn Aeroplane and Motor Co. Ltd. as the joint guests of that firm and D. Napier and Son Ltd. on Tuesday, May 15

The primary object of the visit was to witness a demonstration of the Blackburn Ripon II torpedo-carrier, fitted with the latest Service type of Napier Lion engine. A demonstration covering a considerably wider scope than this was however provided for the visitors

On arrival at Brough the party found a long line of machines drawn up on the tarmac outside the works. In order of ascending size there were two Blackburn Bluebirds, one with a Cirrus engine, the other on floats and with a Genet engine. Next came the Blackburn Lyncock, which is described as a " light fighter," fitted with a Lynx engine; then a Blackburn-built Siskin III.A (Jaguar engine), followed by one of the well-known Blackburn Dart torpedo-carriers (Napier Lion engine), and finally the Ripon (Napier Lion engine).

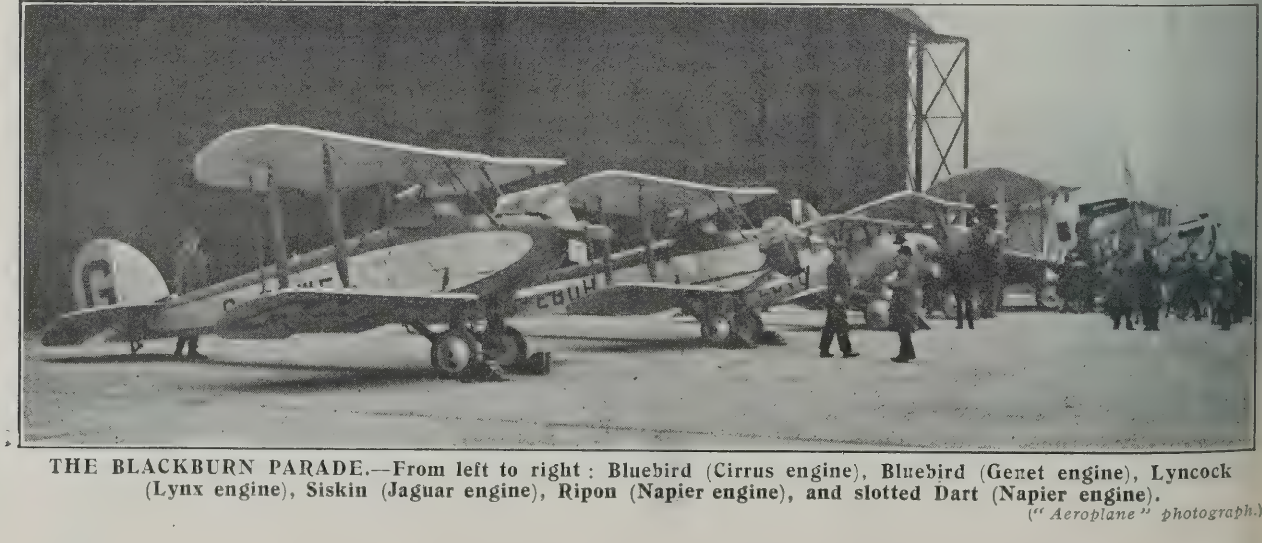
The Dart, which is in extensive use by the R.A.F., is a single-seat torpedo-carrier which, in spite of the enormous load which it carries, is of such compact dimensions that it can be carried on an aircraft-carrier, and has so low a landing and take-off speed and such excellent controllability at low speeds that it is regularly used from and to return to the deck of the carrier ships. The particular Dart exhibited on this occasion was fitted with Handley Page automatic slots.

The Ripon carries the same load as the Dart plus a gunner-observer and a rear gun-turret. The machine is therefore very much more capable of defending itself against attack in the air than is the single-seat type. In spite of this increased load the Ripon is little, if at all, larger than the Dart, and, in part because of improved body shape, in part as a result of the greatly increased performance of the latest type of Napier engine, it has at least as good a performance as its predecessor.

The cleanness of line of this machine can be better gathered from the photograph reproduced than from any description.

The first item of the demonstration was one of folding and unfolding the Ripon's wings—a process which with two men takes no longer—rather less one fancies—than does the same operation on the average modern light aeroplane. Thereafter the Dart took off and gave an excellent exhibition of slow flying, and showed—as a slotted machine is expected to show—that it was under complete control at and below stalling speed.

The Ripon—loaded with a dummy torpedo of standard weight (which is nearly one ton)—then took the air after a remarkably short run and showed that practically fully loaded it could fly just about as slowly and quite as fast as the relatively lightly loaded Dart. Then the Ripon proceeded over the Humber, dropped its torpedo with precision dead off the end of the slipway, zoomed up into the sky, made a perfect loop of remarkably small size, and then proceeded to give a demonstration of slow flying, and of control in an obviously stalled condition which, from the ground at least, looked in no way inferior to any similar exhibition made with the assistance of slots. Straight stalled flying on normal machines is not uncommon, but in this case the Ripon,



THE BLACKBURN PARADE.—**From left to right: Bluebird (Cirrus engine), Bluebird (Genet engine), Lyncock (Lynx engine), Siskin (Jaguar engine), Ripon (Napier engine), and slotted Dart (Napier engine).**
(*" Aeroplane " photograph.*)

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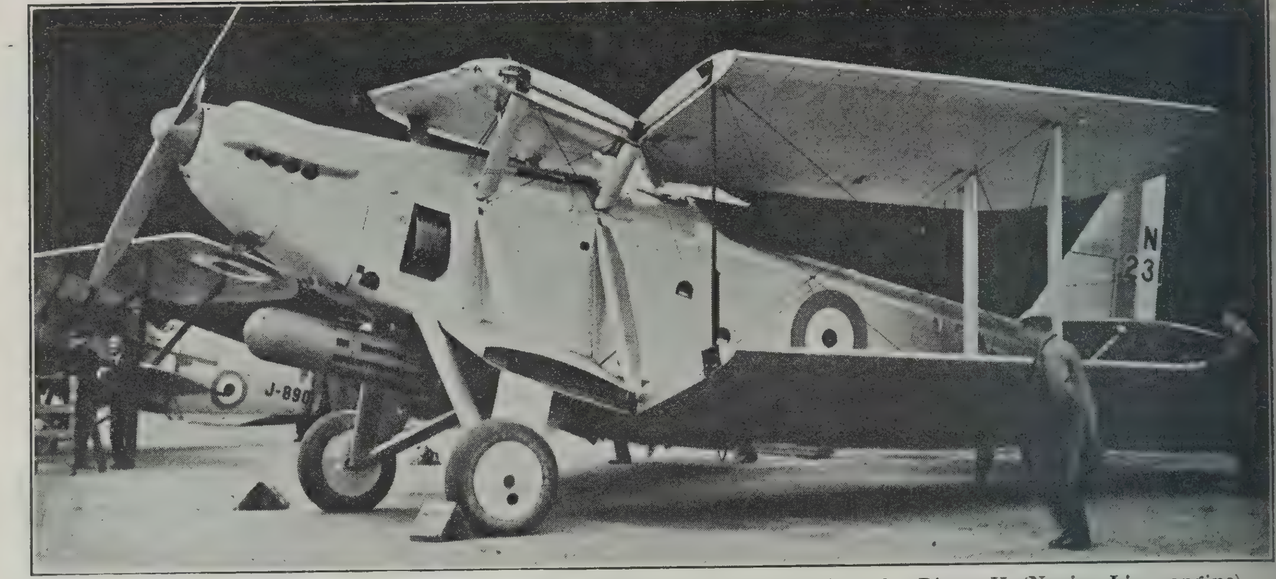


THE BLACKBURN RIPON.—The latest Blackburn two-seat torpedo-carrier, the Ripon II (Napier Lion engine), with its wings folded. This machine is now in production for the re-equipment of the Torpedo Flights of the Fleet Air Arm.—(*"Aeroplane" photograph.*)

stalled and sinking rapidly, was both rolled and yawed through large angles and in a way that showed quite conclusively that ailerons and rudder were definitely effective below stalling speed.

A Velos seaplane, which is very nearly a Dart on floats, gave a very similar display of low-speed controllability at about the same time. Blackburn aircraft, particularly those designed for deck-landing, have always shown remarkable controllability at low speeds, but this exhibition showed to what an extent this quality has been developed.

Sq. Ldr. Noakes, who had just brought the Lyncock up from Martlesham, then gave a display of flying on this machine, during which he performed all those manœuvres that one has ever seen before, including an upward spin of about three turns, and one that is new. This consisted of a half-loop, a sharp turn upside down, and then a half-roll, the whole manœuvre ending at least 100 ft. higher than it began.

The behaviour of the Lyncock was a most remarkable demonstration of what can be done to-day towards producing a cheap moderately-powered high-performance fighter. With an Armstrong-Siddeley Lynx engine of 200 h.p. only this machine carries the same fuel and armament as are carried on standard Service fighters used in this country to-day. And her performance is practically identical with that of any fighter now in use in the R.A.F. that has an unsupercharged engine.

If fitted, as it can easily be, with the supercharged Lynx it would equal even these latter. Moreover, because of it small size and low weight it can outmanœuvre the large machines. And it can be sold at approximately one-half th price of its rivals of twice the power.

Thus the Lyncock should prove an exceedingly attractiv machine for those military Powers who require a reall high-performance fighter at a reasonable price. An although its performance is by no means up to that o certain new fighting machines of higher power which ar now under test and development, it is so astonishingly goo that it has an undoubted interest even for the R.A.F.

After the demonstration of the Lyncock sundry Blackbur Bluebirds were flown, and such visitors as felt inclined t brave the cold and penetrating drizzle that now envelope Brough were given a chance of taking the air.

Apart from the inclemency of the weather this was a exceedingly interesting and well-arranged event. Th guests who travelled up from London were carried in couple of reserved restaurant cars attached to the 10.1 train at King's Cross and arrived at Brough a little afte 2.0 p.m., after an excellent lunch. They were brought bac in the same cars, leaving Brough at 5.18 p.m., and reache King's Cross after an excellent dinner at 9.25, and ther was a buffet at Brough for their convenience.

And as may be gathered from what has already been sai the demonstration of Blackburn aircraft and of Napie engines was well worth travelling to Brough—even unde less comfortable conditions—to see.—W. H. S.

LUCUS A NON LUCENDO.

I have spent many years in the journalistic world and have had many exclusive interviews with famous people. But the outstanding incident in my career is my interview with the Famous Authority on Air Matters.

I imagined I should have great difficulty in reaching the Presence, but to my surprise the magic name of *The Goldfish-Keepers' Gazette* gained me instant admission. I had called to ask his considered opinion on a point which was causing controversy in our small community, and had divided us into two camps. The point at issue was this :—"Can goldfish be transported by air or would they be air-sick?" The interview was to be published in the *Gazette* and the opinion expressed therein was to be legally binding and the whole argument was to end. With pencil poised ready for his weighty words, which I expected to be delivered in three minutes, I entered his sanctum.

He told me he was "snowed under." His table did not belie the fact. It was strewn with hundreds of letters, sheets and sheets of paper on which were written pencilled notes, and a young library. I could see he was a very methodical man. He then told me what a difficult task he had. Nobody listened to him. He gloried in attacking the Government. He had no money with which to make his concern the driving force it ought to be. British Aviation was really non-existent. France had over twice as many aeroplanes as we had. They could in fact, drop 300 tons of bombs on England within twenty-four hours of hostilities being declared and continue the scale of attack indefinitely.

All this was very interesting, but it didn't concern our goldfish. However, with pencil poised I waited. It was no good trying to steer a man of personality and temperament. I could see at a glance he was both.

He then went on to deplore the state of British Air Powe which, he said, like Sea Power, to be effective and pe manent must be based on a sound economical basis for peac purposes. On any other basis its maintenance could onl be artificial and burdensome in time of peace. I quite agree with him. It certainly sounded all right. We were gettin nearer our subject, however, he had brought in the wor "sea."

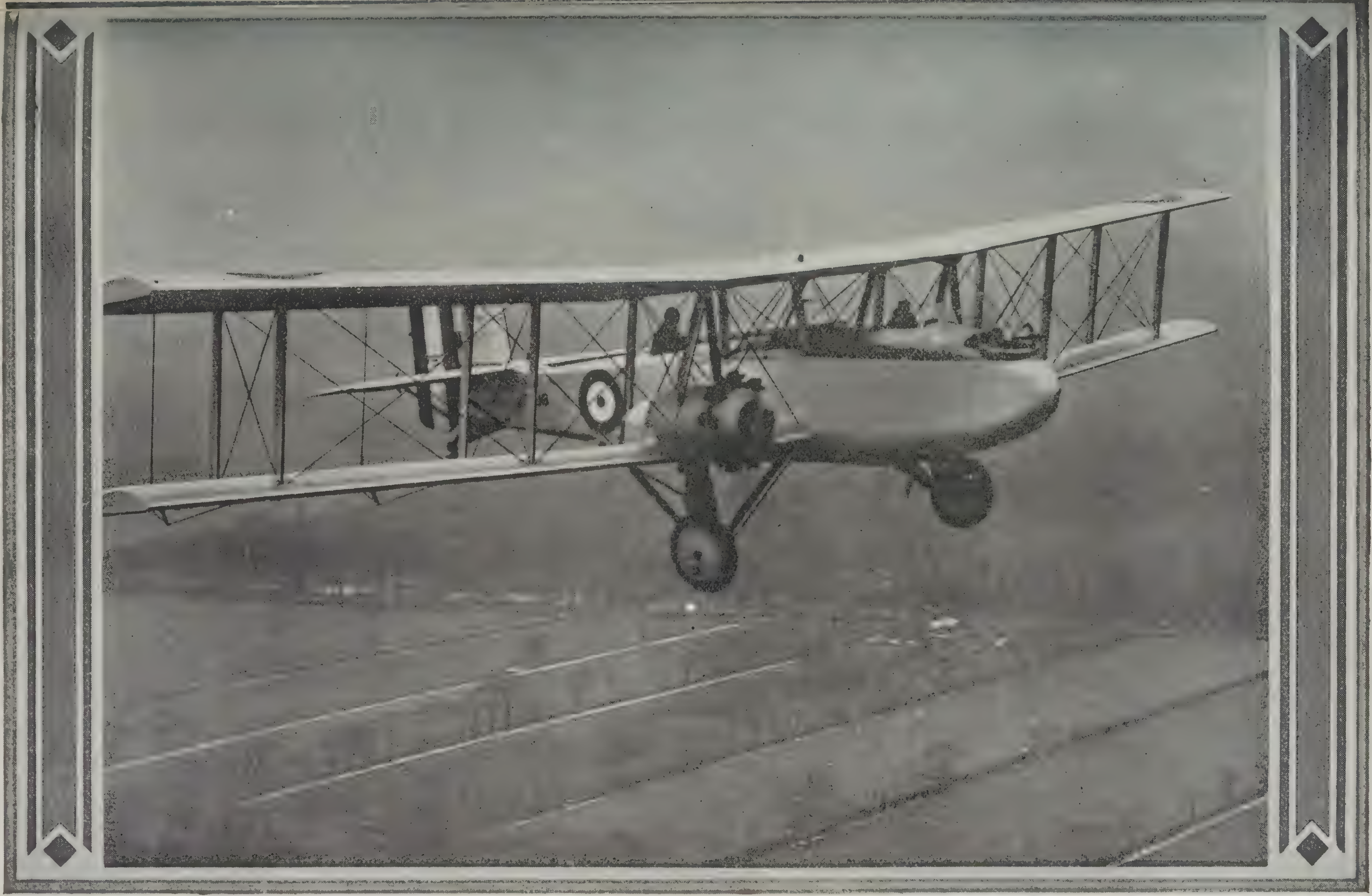
In 1918, I was informed, our Aircraft Industry was th finest and best organised in the World. To-day, it was a insignificant struggling concern. And, I was to remembe the country's Aircraft Industry was the foundation of i Air Power. By Jove! I had never realised that before. Bu of course, how true it was.

Then, according to him, everything connected with Avi tion of the Commercial species could be converted into Avi tion of the Military species. Which fact must not be ove looked in estimating the aerial strength of any countr If a nation has an enormous Commercial Aviation it is tower of strength in that it has also a Powerful Air For without having a single machine in it. Which, of course, perfectly true.

I didn't quite see the connection between that an goldfish. However, I settled myself a little deeper in his arm chair and waited. As I said before, it takes time to achie the desired, and patience is my *forte*.

But, he continued, there was another side to the questio London, the Heart of the Empire, and Central Nerve Cor plex of Finance, Government and Administration was, fo geographical and industrial reasons the most vulnerable of a cities in the world to aerial attack.

At this point I tightened my grip on my pencil. Perha



(Photograph by "Aeroplane.")

BOULTON & PAUL ALL-METAL "SIDESTRAND" DAY BOMBER.

he was going to give me a few hints about protecting goldfish from air raids. But no! it was a false alarm.

Now I was asked to "take our Navy." Exactly where I was to take it he didn't say. Our Navy was absolutely useless against aircraft. Aircraft could sink them without taking aim. A nice fat bomb dropped just alongside would do all that was necessary. In fact a bomb just alongside was infinitely more effective than a direct hit. Splendid! I shall know what to do next time.

Then of course we came to the most wonderful of all the instruments of warfare—the Smoke Screen. These could be created, both vertical and horizontal, on an immense scale by a couple of aeroplanes and a supply of strong cigars. The poor gunners on the ships were rendered *hors de combat* by the fumes and couldn't shoot. The captain and most of the crew fell down in a dead faint and the ship just ran onto the rocks and was wrecked. Of course, when you come to think of it, it's very simple. I wonder no one has thought of it before. But the F.A.O.A.M. placed great faith in this method of warfare. A ship won't stand a dog's chance in the next war, so I was told.

Anyhow, by this time I had lost all interest in goldfish. But I intended to bang in a question at the end of the interview. On he went.

Did I know, he inquired, that Imperial Airways hadn't killed anybody since 1924? No? Well, it was a fact. They hadn't! Of course, Foreign Lines have done in an *awful* lot of people, but not so the British. They daredn't do it or they wouldn't have any machines left. So you see, it stood to reason that they had to fly *very* carefully.

If they crashed a machine, it would take weeks to get another, because our struggling Aircraft Industry wasn't in the position to get an order in the morning and despatch the machine by the evening post,—*especially* those big Argosies. It was doubtful whether they kept sufficient brown paper in stock to wrap them up in.

Besides there's *only one man* in each of the British aircraft firms, and he was there to open the letters. When he came across an order he had to write a lot of letters to different people asking them if they had a spare five minutes and if so to come along and help get the new machine out.

I was told that there was an awful fuss made every time a new machine was turned out in England. Press photographers tore helter-skelter to wherever the event was taking place and photographed the machine from all angles. Somebody always toddled along and christened it, and the papers said it was the finest aeroplane that had ever been turned out. Whereas if it had not been for the Government's Invertebrate Air Policy during the past nine years we should have been turning out aeroplanes in "mass production" and selling them on the Glad and Sorry system. But he didn't tell me whether they would be delivered in plain wrappers or whether the manufacturers' men would fit the propeller and inflate the tyres.

Next we came to our defaulting Air Minister! Old Sam wasn't a bad stick really, but he had funny habits. For instance, the other day, Sam got on his hind legs and told everybody that the Air Defence of this country was *an urgent and vital problem* (F.A.O.A.M.'s italics). Then when the Government asked him how much money he wanted to run his circus, Sam said he'd be quite content with a few thou. less than last year because he wasn't going to buy any more aeroplanes for Home Defence. He only wanted a couple of new Squadrons for India and the Indian Government would pay for those.

The F.A.O.A.M. said that Sam had a very strange sense of humour really. He was an eloquent eulogist and indulged in rhetoric and ice skating. The mention of ice made me wonder whether he was going to tell me it was necessary to freeze goldfish to transport them by air. But no! His next words were a wholesale condemnation of the Government's Attitude towards Imperial Air Routes.

Did I know, he inquired, that eight years ago we were in the most favourable position in regard to Persia—long before aeroplanes came into the picture in fact—and now we had been shown just where the door was and hadn't been able to get back again? The fact was that the Shah of Persia wanted our people to teach his people to fly, but our Government said it didn't like the Persians' colour-scheme and turned the idea down.

Then the wily Bolsh, with Fritz, called on the Shah and said *they* would teach the Niggers to fly (only of course they didn't say "Niggers" otherwise there would have been a row) if the Shah would let them buzz about Persia with their commercial 'buses. The Shah said "Yes, certainly"; and then the Bolsh said: "But you mustn't let those British fly over your country": and the Shah said: "Not likely, I 'ates 'em," and there you are. We got the sack, and now we couldn't fly to India. That was the outcome of eight years of procrastination and our lovely little air route to India comes to a full stop at Basrah.

At this point I began to feel sleepy. I had entered his presence at five o'clock and now the quiet of the Strand only occasionally disturbed by the noise of a passing t and the striking of a distant clock. The voice went on what it said I cannot tell you. I fell asleep.

And in my dreams I found myself at Croydon aerodro The F.A.O.A.M. was still with me and in stentorian to he was telling me how small our Commercial Aviation w We had a total of but twenty commercial machines, cluding the five on the bagatelle bi-weekly service fr Cairo to Basrah. And, Be It Remembered, Commer Aviation was readily convertible to War Purposes.

Our own Government had admitted that in 1921 w they presented the Germans with "The Ultimatum London" the opening sentence of which reads: "In vi of the extreme facility with which the rapid transformat of Civil Aviation to Military Aviation can be carried etc." There you are, there was no getting away from and we only had twenty machines. It was a disgrace the Old Country and the great pioneers who had built the Empire.

Suddenly the arrival signal in the control tower Croydon rang and I awoke to find the F.A.O.A.M. talking and the telephone ringing. Hastily gathering hat, pencil and note book, I said a perfunctory thank and good night and left the office. As I did so I hear clock strike twelve.

In the outer office a clerk slept the sleep of the ov worked. As I went through the door I paused and this what I heard: "Yes! I'm so sorry but I've had a m important interview with a representative of the Press. asked me my opinion on a vital problem and it has tak rather a long time to explain my views. But we are goi to get an enormous amount of publicity out of it. Ye this show is beginning to make itself felt and bef long the Government will be unable to ignore the Vo of the Industry. I shall be home in time for breakfa I'm simply snowed under."

Naturally, my wife did not believe a word and har spoke to me for a fortnight.

They whisper in *Press Circles* that a lady journalist on inteviewed the F.A.O.A.M., and made him listen for t hours. The longest word he managed to get in was "Yes It is said that he now sits for hours brooding over this o blot on an otherwise unblemished career as a talker.

SHOWING THE ITALIAN FLAG.

On May 25-26 a squadron of Italian aeroplanes, totalli about 60, under the supreme command of General t Marchese de Pinedo, will make a demonstration tour of t Western Mediterranean.

The proposed itinerary of the tour is as follows: Ortobel —Elmas (Sardinia)—Pollenza (Balearic Islands)—Los Alc zares (near Tortosa, Spain)—Berre (near Marseilles, France) Ortobello, a total distance of about 1,750 miles.

Among the passengers to be carried on this tour will Signor Balbo, Under-Secretary for Aeronautics, and t British, French and U.S. Air Attachés.

PARIS—AKYAB.

On May 8 Capt. Pelletier Doisy, accompanied by Cap Gonin and M. Carol left Le Bourget on a Potez 29 (470 h. air-cooled Lorraine-Dietrich engine—Jaguar type), in an tempt to fly to Tokyo.

On May 9 he arrived at Bucharest after a landing at Ar on the previous evening owing to strong head-winds.

On May 10 he flew from Bucharest to Aleppo, a distan of 900 miles, in 9 hours non-stop, in bad weather.

On May 11 he reached Basrah from Aleppo (780 miles), May 12 he flew from Basrah to Karachi (1,300 miles), and May 13 he reached Allahabad from Karachi (1,000 miles).

On May 14 he flew to Calcutta.

On May 16 he left Calcutta for Akyab. Soon after taki off from Akyab for Rangoon he was forced to land in a padd field and his machine was wrecked. Capt. Pelletier Doisy w unhurt but both Capt. Gonin and M. Carol were taken hospital, the former with a simple fracture of the right ar and the latter with a head wound.

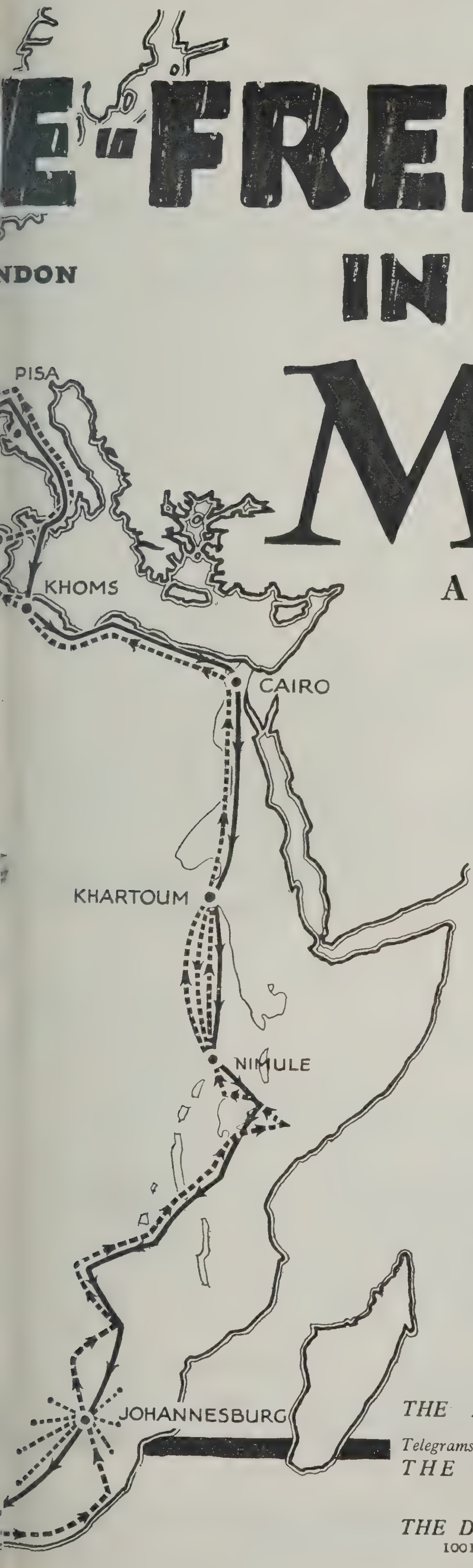
AIR AFFAIRS IN PARLIAMENT.

TRANS-ATLANTIC PROPOSITIONS.

In the House of Commons on May 9, in reply to a question Mr. Hurd, the Secretary of State for Air said that the establis ment of air ports in the Irish Free State and Canada was a matt for the Governments concerned. He promised that any developme which, as a result of the employment of aircraft, would expedite t delivery of sea-borne trans-Atlantic mails, would have the sympathet co-operation of both the Postmaster-General and himself. In rep to a supplementary question, Sir Samuel Hoare said that he h noticed with satisfaction the starting of an air-mail service fro Rimouski on the St. Lawrence in connection with our ocean steamer

Cdr. Bellairs asked if it was usual to establish air-mail ports on t strength of a single flight failing to arrive within 600 miles of i destination and carrying nothing but petrol.

E-FREE MILES
IN THE SAME
MOTH



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"Unlawful," by Charles Turner. Stanley Paul and Co. 256 pages, 7s. 6d. net. From THE AEROPLANE Book Dept.

Major C. C. Turner, the author of this exciting story, is described on the wrapper as an expert on the subject of aircraft.

There is no fault to be found in the hero's race to Moscow by air on the trail of the stolen Air Ministry secret papers, and lots of readers will sympathise with the villain's efforts to blow up the Royal Aircraft Establishment at Farnborough, but Maj. Turner has not succeeded in making his characters into interesting people. One has difficulty in remembering which is which because there is no individualism.

The plot is good and the adventurous bits are really thrilling, but Mr. Turner is obviously in difficulties when it comes to tackling the "heart-interest" bits. Also he ought to have consulted somebody before he dressed his heroine in "a purple dress adorned with one large ruby."

—C. M. MCA.

[NOTE:—This is what C. M. McA. calls "constructive criticism."—C. G. G.]

Blood and Bolshevism.

"The Devil's Dagger." By Capt. Maurice Kiddy. 288 pages. Hutchinson and Co. 7s. 6d. net. From THE AEROPLANE Book Dept.

Captain Maurice Kiddy, late R.A.F. and more recently known as the founder of the Folkestone Cricket Week, which arose after he had started the R.A.F. Cricket Week, has now blossomed forth as an author. Capt. Kiddy's actual occupation is that of Secretary to the Institution of Structural Engineers, originally the Concrete Institute. His book distinctly deals with matters which are concrete rather than abstract, and its structural engineering is undoubtedly good, though there are times when he stresses the long arm of coincidence beyond its elastic limit.

The story of the book is concerned with a hunt for a dagger which carries with it vast wealth, unlimited power, and a curse. The dagger exists in Bolshevik Russia. It is desired by a Russian Napoleon for his own aggrandisement, and also by a British financial group so that its evil influence may be removed. Captain Kiddy's financial and secretarial experience is reflected in this financial dealing.

There are times when the story reminds one of John Buchan's books, and those who like real shocks, thrills, excursions and alarms will enjoy it. The details of Bolshevik tortures are, at any rate, educative. And, unlike most shockers, the book is written in good English.—C. G. G

Air Law.

"Fixel's Law of Aviation." By Rowland W. Fixel, of the Detroit, Michigan, Bar. 420 pages. $7.50c. From THE AEROPLANE Book Dept.

Those who are interested in the laws of the air and wish to be internationally informed on the subject will find much of interest in Fixel's Law of Aviation, which deals with the whole subject of air law from the American point of view. This book should be of considerable interest to British air lawyers (no relation to sea-lawyers) and to anybody in this country who proposes to do aerial business in the States.

Before the production of Mr. Fixel's book an attorney had to search the statutes of 25 States in order to find out what his client could or could not do without getting into trouble. Mr. Fixel shows his readers how to deal with such things as air navigation laws, life insurance contracts, what is prohibited and what is allowed in aircraft operation and transportation, what are the liabilities of owners of buildings projecting into navigable air space, and when an aeroplane becomes a common carrier. It also deals with the history of air ventures, with the conflicting theories of sovereignty in air space, with international regulations and with the air agreements between the United States and Canada.

Air War and Air Law.

"Aircraft and Commerce for War," by J. M. Speaight. (London: Longman, Green and Co. Ltd. From THE AEROPLANE Book Dept. Price 6s. net.)

Whatever attitude one may take as to the value of International agreement concerning the methods which may or may not be employed in the waging of war, the arguments advanced by Mr. Spaight in this little book deserve attention.

Briefly his argument is as follows:—

Modern war has ceased to be entirely an affair of battles, and between modern States victory or defeat are as likely to be gained as the result of economic pressure, as by the effect of military operations. In the past economic pressure has been applied by Sea Power, by capture of enemy merchant vessels, or seizing contraband cargoes in neutral ships, or by blockade.

In the next war aircraft will largely take the place of seacraft in the interception of sea-borne supplies. For such interception to be complete enough to be effective, the "blockading" Power must intercept not only supplies carried by enemy ships, but also those in neutrals

Aircraft cannot stop and search ships at sea, nor can they capture them and take them to a home port. But they can, and will sink suspect ships, enemy or neutral, despite such action being in general contrary to International law.

The sinking at sight of neutral ships, however well-founded may be the suspicion that they are carrying enemy supplies, will inevitably tend to embitter the feelings of neutrals. British efforts during the last war to prevent supplies from America reaching Germany, though they fell far short of sinking American ships, undoubtedly delayed American entry into the war on our side. But for the vastly greater ill-feeling provoked in America by the German submarine campaign our so-called blockade would probably have kept America a by no means too friendly neutral until the end

In any future war the Power which uses aircraft to destroy neutral ships carrying such supplies will be assured of the ill-will of all neutrals concerned, and will probably cause many of them to join the enemy. In the last war after many protests from neutrals a series of agreements was made between the British Government and representatives of a number of associations representing neutral shipping and trading interests, under which these neutral associations undertook that goods consigned to or guaranteed by them should not reach the enemy in any form. In return the British Government undertook not to interfere with cargoes which carried these guarantees, unless in exceptional cases they had evidence that some attempt to defraud the associations had been made.

Generally speaking these agreements were faithfully kept by the neutral associations, who were thereby enabled to carry on their legitimate trade with the minimum amount of interference.

These agreements were improvised during the War when neutral ships were at the worst either searched at sea or sent into a British port for examination and dealt with by the Court of International Law if they were considered to be carrying illegal cargoes. When aircraft are used to intercept commerce much worse things must befall neutral shipping if some agreements similar to those above-described do not permit them to go about their business in security.

These agreements should be not improvised to overcome an already active hostile feeling among neutrals. Agreements should be made in advance, recognised by International law, and be of a nature to come into force automatically at the outbreak of war.

The argument seems perfectly sound. If it be necessary to go to war with one specific enemy it is but prudent to try to avoid arousing the hostility of other powers not directly concerned with the matter at issue. And if some general agreement as to the methods by which air power shall be exercised can be made in advance it certainly seems worth while to try and make it.

"The Suburbs Shall Shake," Etc.

Those readers of THE AEROPLANE who disbelieve the authenticity of the quotation on the front cover of THE AEROPLANE of May 9 are reminded that, in common with all other books, copies of the Bible may be had, at all prices, from THE AEROPLANE Book Department, 14, Bream's Bldgs., E.C.4.

A COMPETENT AUTHORITY.

The May issue of the **Journal of the Royal United Service Institution** reviewing **All the World's Aircraft, 1927,** states:

"ALL THE WORLD'S AIRCRAFT is that unusual thing, an interesting reference work. This year it is as well produced as during the sixteen former years during which it has appeared, while it is much more complete. When once one has started to dive into its contents it is difficult to stop. There are so many facts about aircraft, about aeronautical progress at home and abroad, about airships and aero engines that *ought* to be studied and that can be studied in this volume without fatigue. And a high standard of accuracy is maintained throughout."

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THE SHOREHAM MEETING.

THE SHOREHAM MEETING.—Above : The formation of an Avro Gosport and two D.H. Moths getting off to bomb the fort. Below : A few of the machines present. —(*"Aeroplane" photographs.*)

The meeting held by the Southern Aero Club at Shoreham on May 19 was fortunately favoured with reasonably fine, if cold, weather, and was a distinctly cheerful and informal affair. There was no real racing, and as a result no need for any rigorous organisation. Possibly for the onlooker a slightly more exact conformity with the programme would have had advantages, but on the other hand as things were there was a continuous display of flying during the whole afternoon, and even though it was sometimes difficult to discover what the flying was about there were no periods of inactivity.

The first event of the programme was a fly-past of the assembled types of aircraft. These included the Club's Avro Baby,—which with the Cirrus engines flies extremely well,—but not the Club's Grahame-White Bantam. This was on show with an airscrew disconnected from its engine and rotating freely, the wrong way round, in the breeze which blew most of the afternoon.

The other machines in the parade were Mr. Bellairs' Avro Avian, an Avro 504K, one of the latest Avro Gosports with an Armstrong-Siddeley Mongoose engine flown by Mr. Luxmoore of A. V. Roe and Co. Ltd., a D.H. Moth with the D.H. Gypsy engine flown by Mr. Broad, and a Blackburn Bluebird (Genet engine) flown by Mr. Blake.

Next was an obstacle race between Mr. Pashley and Mr. Miles, the Club's instructors. The competitors had to run to their machines, sort out from a jumbled heap their own coats, overalls, flying caps, etc., change a wheel on each of their machines, start up, take off, fly three circuits of a short local course, and land. Mr. Pashley won this event by a shortish head, and thereafter he retired to a field adjoining the aerodrome and carried on with the serious business of joy-riding for the rest of the afternoon.

There followed a demonstration of stunting by Mr. Broad on the Gypsy-engined Moth, and another by Mr. Luxmoore on the Gosport. Both pilots made the most of the qualities of their machines in these performances, and put up an excellent show.

A wing-folding competition which included taking-off, flying a circuit and landing between folding and unfolding was won by Mr. Broad—assisted by Mr. St. Barbe—on the superior speed of the Gypsy-Moth. Owing to a minor contretemps with a sticking jury-strut on the Moth, Mr. Miles on Mr. Bellairs' Avian got through unfolding and getting away several seconds ahead of the Moth, but was outpaced in the air. Mr. Stack on the A.D.C.'s service Moth found a little trouble in getting his engine to start promptly and finished third.

Mr. Blake was worried throughout the afternoon by a similar reluctance on the part of his engine, but with the help of relays of volunteer swingers, he was able to get in quite a lot of flying and to demonstrate the controllability and general airworthiness of his Bluebird. There can be no doubt that the bitterly cold wind was the prime cause of this engine obstinacy.

At intervals during the afternoon Mr. Broad, Mr. Luxmoore, and Mr. Bellairs took part in a height contest. In this event an observer armed wth a stop-watch and an altimeter took the time from opening the throttle for taking off until a reading of 2,000 ft. was shown on the altimeter. Mr. Broad's Moth with the new D.H. engine, took 2 mins. 35 seconds—which is a remarkably fine performance for a machine of this class—and won the event easily.

A taxying competition, wherein competitors were required to circumnavigate a rather intricate course marked out by flags led to many casualties on the part of flags, but fortunately to no more serious consequences. Miss O'Brien got one flag through her airscrew disc, and Mr. Mealing of the Department of Civil Aviation, who had come down on the Department of Civil Aviation's Moth G-EDCA to look on, struck one of the flags with his "prop" when taking off, hard enough to cause him to stop and make a careful examination before proceeding further.

The last item on the programme—the bombing of a native citadel—actually took place about the middle of the proceedings. The change in the ordered sequence of events was arranged because owing to a failure of hydrogen supplies, a balloon-bursting competition had to be abandoned, but unfortunately it led many spectators to conclude that it was the end of the proceedings and many of them faded away in consequence. The native citadel followed the precedent set at Air Force Pageants. It was naturally on a reduced scale, and so was the bombing formation—led by Mr. Luxmoore on the Avro Gosport—with Mr. Broad and Mr. Stack, on Moths, in support. But the firework part of the show was excellently done, and the three pilots concerned really looked as though they meant business. Moreover, the native garrison—composed of boys from Lancing College—looked rather more like the idea of desert warriors than is usual in these events.

An impromptu bombing competition in which competitors attempted to drop bags of flour onto a motor-car under way on the aerodrome provided the motor-car driver with a fair amount of amusement, but was scarcely a success as a display of marksmanship. Actually several "bombs" had they been real would have ended the car's career, but this fact was scarcely obvious to the onlookers.

Mr. Raynham then made an effort to replace the balloon-bursting display by arming his Avian with a piece of fishing net lashed to one strut and his interplane wires and attempting to catch in it a balloon towed from Mr. Bellairs' Avian on a long length of cotton. Unfortunately the balloons refused to wait till they were caught, and either broke away or burst, and proceedings ended with the presentation of the prizes by Mrs. Raynham.

RESULTS.

Club-Instructors' Obstacle Race, Mr. Pashley (Avro 504K).

Wing-folding competition, 1st Mr. Broad (D.H. Moth, D.H. Gypsy engine); 2nd Mr. Miles (Avro Avian, Cirrus Mk. II engine); 3rd Mr. Stack (D.H. Moth, Cirrus Mk. II engine).

Taxying Competition, 1st, M. Broad (D.H. Moth, Gypsy engine); 2nd, Mr. Luxmoore (Avro Gosport, Armstrong-Siddeley Mongoose engine); 3rd Mr. Blake (Blackburn Bluebird, Armstrong-Siddeley Genet engine); Booby Prize Mr. Raynham (Avro Avian, Cirrus engine).

Height Competition, 1st Mr. Broad (D.H. Moth, Gypsy engine), 2 mins. 35 secs.; 2nd Mr. Luxmoore (Avro Gosport, Armstrong-Siddeley Mongoose engine), 2 min. 46 secs.; 3rd Mr. Bellairs (Avro Avian, Cirrus engine), 3 min. 47 secs.

Prizes for Smartest Machines : 1st Mr. Stack (D.H. Moth), 2nd Mr. Raynham (Avro Avian).

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"GET OFF" AND CLIMB

Height Competition

Quickest time to 2,000 feet. Won by Captain H. S. Broad, A.F.C. — Moth (85 — 100 H.P. "Gypsy").

MOTH **FIRST**

MANŒUVRABILITY ON GROUND

Taxi-ing Competition

Not only was the Moth the only machine to complete the tortuous course without touching any single mark flag, but it also made the fastest time. Won by Captain H. S. Broad, A.F.C.—Moth (85-100 H.P. "Gypsy").

MOTH **FIRST**

APPEARANCE

Prize for the Smartest Machine

Won by Captain N. Stack, A.F.C.— Moth (30-80 H.P. "Cirrus").

MOTH **FIRST**

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Streets.

THE SYDNEY AERIAL PAGEANT.

On Mar. 31, the Flying Club operated by the New South Wales Section of the Australian Aero Club held an Aerial Pageant at the Mascot aerodrome, Sydney. In spite of bad weather in the morning the afternoon turned out fine, and a huge crowd, estimated at 20,000 inside the aerodrome and many thousands more on what has been opprobriously termed "Scotchmen's Hill," outside, enjoyed an excellent afternoon's amusement.

The principal event of the afternoon was the Annual Australian Aerial Derby and Derby Handicap over four laps of a 10½ mile circular course.

For this event there were twenty-four entries of which ten were competing solely for the Handicap.

The Aerial Derby was open to all aircraft whether owned by Government Departments or by private persons or firms, but aeroplanes owned by a Government Department or by a Club were not eligible for the Handicap prizes.

The Aerial Derby was won by Flg. Off. M. Mulroney, R.A.A.F., who, starting from scratch, completed the course at an average speed of 124 m.p.h., on a specially rigged single-seat D.H.9a (400 h.p. Liberty engine). Second and third were: Sq. Ldr. Jones, R.A.A.F., on a single-seat D.H.9a at a speed of 118 m.p.h., and Wing Cdr. L. J. Wackett, D.F.C., A.F.C., R.A.A.F., on the Wackett Widgeon amphibian flying-boat (Jaguar engine) at a speed of 109 m.p.h.

Flt. Lt. F. Eaton, R.A.A.F., on a single-seat D.H.9 (Nimbus engine) and Capt. E. J. Jones, Deputy Controller of Civil Aviation, on a departmental D.H.50 (Nimbus engine) who made 130 and 121 m.p.h. respectively over the course, were disqualified for cutting one of the turning points.

Flt. Lt. Eaton did one lap at 150 m.p.h. and Capt. Jones covered his last lap, which was not the one on which he was disqualified, at 138 m.p.h., so that these two machines were undoubtedly the fastest in the race.

The Handicap was won by Mr. L. J. Brain of the Quantas Company on a D.H. Moth (A.D.C. Cirrus II engine), with Mr. H. W. Ross on a fourteen-year-old Curtiss JN-4 (90 h.p. Curtiss OX-5 engine) second, and Mr. F. Drayton of the Golden Aircraft Co. Ltd. on a D.H. Moth (Cirrus II engine) third.

The first event of the afternoon was a handicap race for Club-trained pilots all of whom had to fly D.H. Moths (Cirrus engines). For this event there were twenty-eight entries with the result that six preliminary heats and two semi-finals had to be run off on Saturday, Mar. 24. The first two in each of the semi-finals competed in the final on Mar. 31 and this was won by Mr. G. N. Mills with Mr. G. Henry second and Mr. C. R. Ferguson third, all on D.H. Moths.

The second event was an Aerobatic Contest for Club-trained pilots, again flown on Club Moths. Competitors had to climb to 3,000 ft. and perform the following evolutions in the order given:—Two complete turns of a spin starting and finishing facing the Club hangar; Immelmann turn, left; Immelmann turn, right; Loops; Roll, right; Roll, left; Half-roll, right; Half-roll, left, finishing with three minutes' free flying.

For this event there were fifteen entrants. Preliminary tests were made before the meeting with semi-final tests on Mar. 24. Two competed in the final on Mar. 31 and Mr. E. H. Chaseling was adjudged first with Mr. N. F. Stewart second.

The third event known as "The Old War Dogs' Handicap" was open to pilot members of the Club who served in the Flying Services during the War 1914-18. This event was won by Mr. P. J. Taylor, M.C., on a D.H. Moth X with Mr. H. C. Ross second on his Curtiss "Jenny" and Capt. R. W. Reid third.

The War Pilots' Aerobatics Contest followed. This was similar to the second event in procedure except that competitors had to have the same qualifications as for Event 3. Capt. R. W. Reid was first with Flg. Off. Moir, A.F.C., second, both on Club Moths.

Event 5 was an exhibition of aerial fighting tactics by Capt. E. W. Leggatt, M.C., and Mr. T. W. Shortridge, Chief and Assistant Instructor, respectively, to the Club, both on D.H. Moths. This was a very convincing display, the attention of the crowd being maintained throughout, particularly when one machine was shot down in "Holt flares."

Thereafter followed the Aerial Derby and Derby Handicap Race already described.

Event 7 was a display of formation flying and parachute dropping (dummies) by three D.H.9s of No. 3 Squadron, R.A.A.F.

The next event was a Joyriders' Handicap Race for aircraft which are regularly used for the carriage of paying passengers.

This was won by Mr. H. W. Ross on his aged Curtiss "Jenny," the limit man, at 66 m.p.h., with Mr. L. J. Brain and Mr. H. T. Hammond second and third both on D.H. Moths.

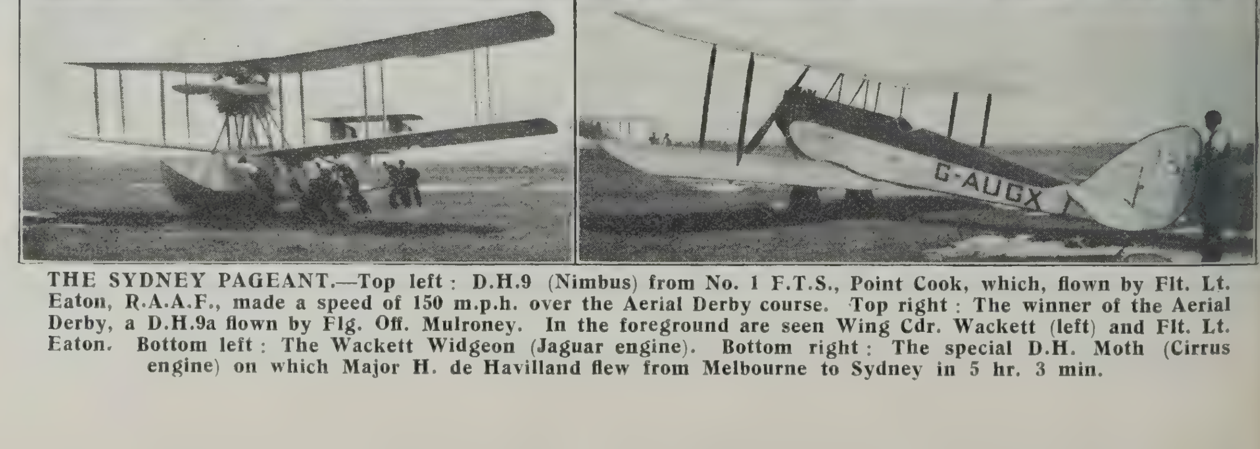
The next event was a race for women pilots trained by the Club, all flying on D.H. Moths. Miss M. Reardon was first with Mrs. A. M. Upfold second and Miss E. M. Follett third. All three flew a good race and this event provided one of the best finishes of the day.

Event 10 was a converging bombing attack on a Vickers Tank, loaned for this event by the Australian Tank Corps, by machines of the R.A.A.F.

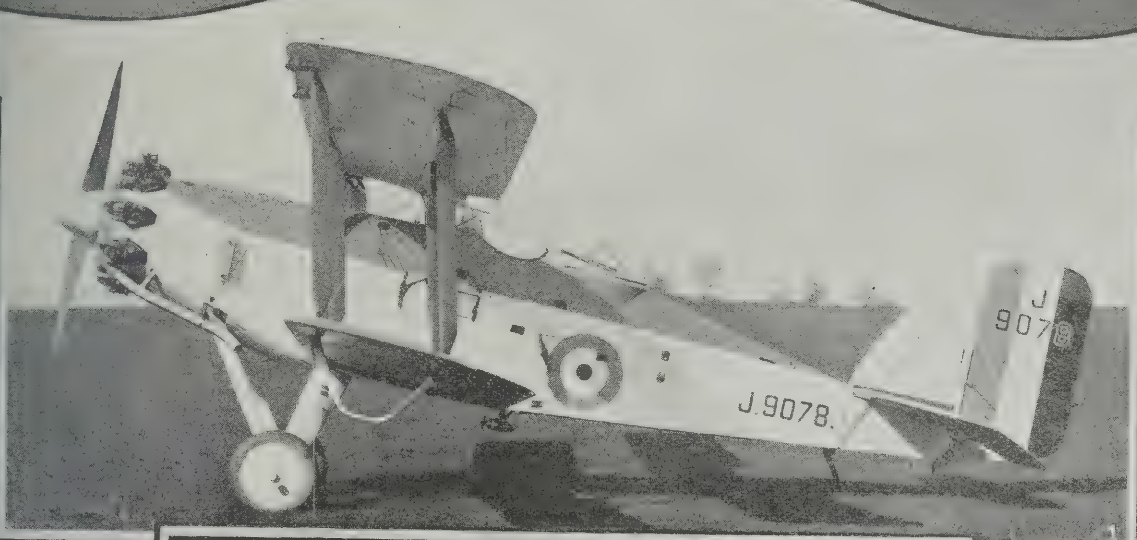
The next event was an aerobatic display by Mrs. A. M. Upfold on a D.H. Moth which display was of a very high standard considering that Mrs. Upfold only obtained her "A" licence on Dec. 22, 1927.

Event 12 was the first exhibition of crazy flying in Australia. It was given by Sq. Ldr. H. G. Smart, O.B.E., A.F.C., R.A.F., who is temporarily attached to the R.A.A.F. as Director of Training. He used a D.H. Moth and his crazy flying amazed everyone and literally held the spectators spellbound. As his particular brand of flying is known in this country, it is not necessary to go into details. Right up to the moment he landed, which he did at about 2 m.p.h. going sideways, he never once flew the Moth as it should be flown and all the time he kept shutting off his engine which got everybody, including all the hardened pilots, on the jump.

Major Hereward de Havilland also gave a fine exhibition of stunting on his special single-seat Moth X, which he



THE SYDNEY PAGEANT.—Top left: D.H.9 (Nimbus) from No. 1 F.T.S., Point Cook, which, flown by Flt. Lt. Eaton, R.A.A.F., made a speed of 150 m.p.h. over the Aerial Derby course. Top right: The winner of the Aerial Derby, a D.H.9a flown by Flg. Off. Mulroney. In the foreground are seen Wing Cdr. Wackett (left) and Flt. Lt. Eaton. Bottom left: The Wackett Widgeon (Jaguar engine). Bottom right: The special D.H. Moth (Cirrus engine) on which Major H. de Havilland flew from Melbourne to Sydney in 5 hr. 3 min.



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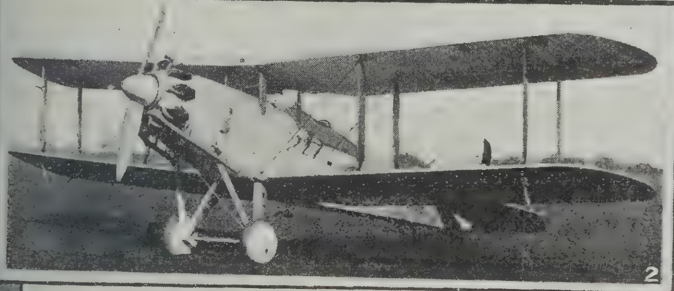

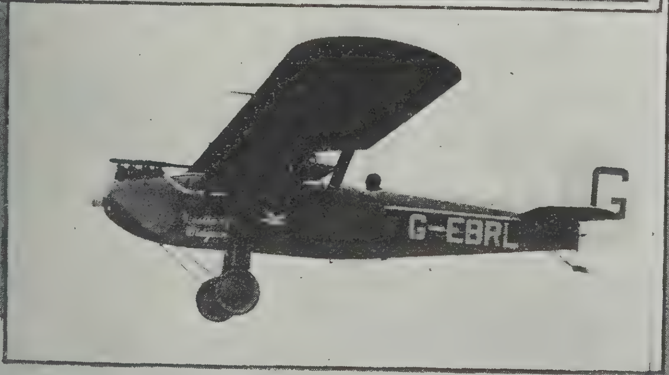

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had previously flown non-stop from Melbourne in just over 5 hours.

An interesting event during the afternoon was the formal presentation to the Aero Club of the Avro Avian given to the Commonwealth Government by Sir Charles Wakefield in recognition of Hinkler's flight. It was flown from Melbourne by Mr. E. W. Percival and was formally handed over to the Club by Sir William Glasgow, Minister of Defence, who later made a short flight in it.

The whole meeting was a huge succees and the Sydney Club deserve every congratulation for the way in which they coped with every detail of organisation. This even included dealing with a flooded aerodrome. A fire engine was obtained to pump off surface water and up to the last moment gangs of men were engaged in spreading gravel and sawdust in the enclosures. In spite of this water still collected and cars were bogged and shoes and stockings ruined.

The Minister of Defence in the course of a speech said that the Club might feel justly proud for it was the most successful civil aviation training organisation in the Empire. He added that instructors and officials of other Australian flying clubs would be sent to Sydney from time to time in order that they might imbibe some of the enthusiasm of the Sydney executive and learn how discipline and administration should be instilled into civil flying organisations.

Since the inauguration of the Club in August, 1926, 54 civilians have gained their " A " licences and 16 have passed the advance course of instruction. Throughout there has not been a single accident involving injury to instructors, pupils or passengers.

Club machines have made 18,000 flights totalling 3,000 flying hours and in addition to actual training work over 4,000 passengers have been carried in short flights.

Although the Club has got a fleet of six aeroplanes it is impossible to cope with the demand for flying training and practice.

The persistent success of D.H. aircraft is only to be expected. With the exception of an amusing intrusion of an aged but nevertheless very active Curtiss JN-4, which won the Joyriders' Handicap race, every event was staged with and won by D.H. aircraft, and in most cases D.H. machines took second and third places as well. A very enviable record.—L. B.

MISTAKEN IDENTITY.

In The Aeroplane of Dec. 14, 1927, a statement was made on the authority of an American paper that Mr. E. H. Casheling of the Australian Branch of the Institute of Aeronautical Engineers, was then in the States at the instance of the Larkin Aircraft Supply Co., investigating American commercial aircraft in view of possible purchases for Australia.

Mr. H. J. Larkin, Managing Director of the Larkin Aircraft Supply Co. Ltd., writes that his firm know nothing of Mr. Casheling and that although interviews with him have appeared in various American papers, he has yet, so far as Mr. Larkin's knowledge goes, to take his place in the Aircraft Industry of Australia.

Mr. Larkin adds, " If you *must* make inaccurate statements regarding our firm in future, would you please see that you say something which will give us a good foundation for a libel case." Knowing Mr. Larkin's habitually combatant spirit, one would hate to say anything libellous about him, though one imagines that his sense of humour would probably spoil him as a litigant.

THE HAMPSHIRE AIR PAGEANT.

The Second Hampshire Air Pageant, which will be held at the Hamble Aerodrome, Hants, on Whit Monday, May 28 promises to eclipse the remarkable success achieved by the meeting last year, when approximately 50,000 people attended.

No effort has been spared by the Hampshire Aeroplane Club, the organisers of the Pageant, to stage for the benefi of the public, one of the finest aerial displays ever seen in the provinces.

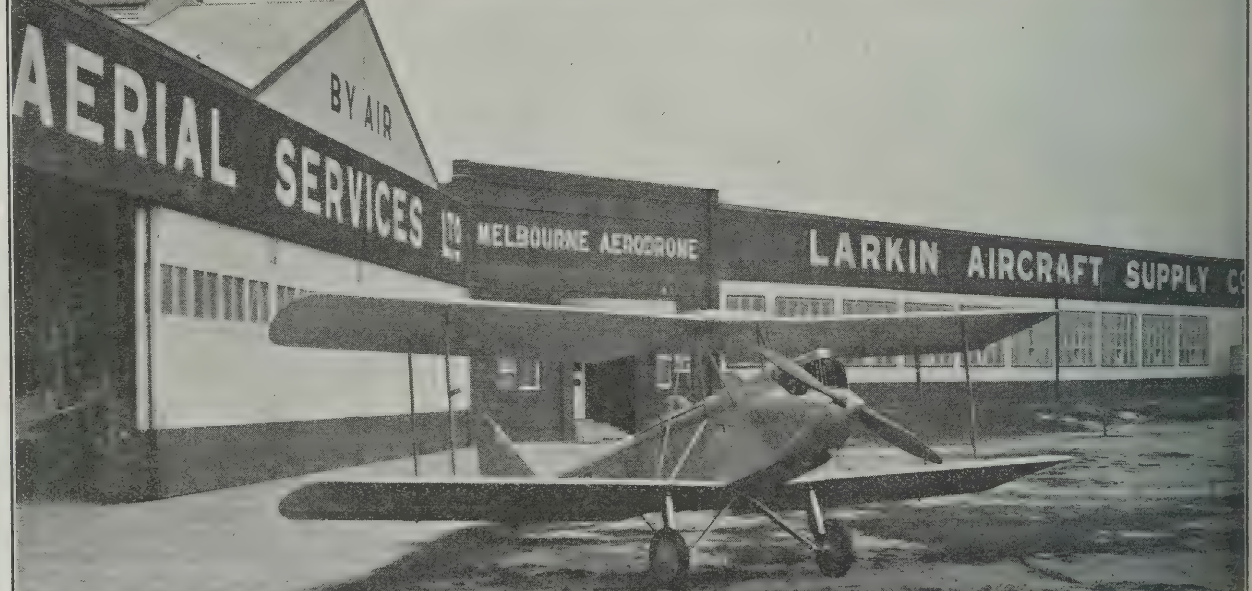
The opportunity of seeing out-of-the-ordinary flying, performed by some of the best civil and Service pilots in the country, will be afforded, and some of the world's finest and fastest aircraft will be on view. The co-operation of the Royal Air Force, which is sending a number of machines has enabled a highly attractive display to be arranged.

The last event of the meeting will be a display of " ground strafing " as the climax to a long and exciting programme A flight of Gloster Gamecock single-seat fighters, led by Sq. Ldr. C. N. Lowe, M.C., D.F.C., the well-known International and R.A.F. Rugby player, will sight a hostile aeroplane, abandoned in enemy territory, and bomb it to destruction. An air combat will also provide an exhilarating spectacle This will be between an Avro Bison fleet-reconnaissance machine and a single-seat Fairey Flycatcher, a fleet-fighter

Other interesting flying by the Royal Air Force will be an exhibition of evolutions, in which a flight of five Gloste Gamecocks will take part, and stunting in formation by the same machines. In the former event, during the manœuvres, the Gamecocks will be met by a sub-formation o Blackburn torpedo-carrying machines led by a Blackburn fleet-reconnaissance machine. This will emphasise the difference between the relative performances of the heavily-laden torpedo-carriers, and the single-seat fighters, showing clearly the need of an escort for torpedo-carriers.

On the lighter side of the programme will be a balloon bursting competition. Each competing machine in turn wil be given three minutes in which to chase and attempt to burs a bunch of ten gas-filled balloons, to be released from th ground. At the end of which time a Verey light will b fired as a signal to land.

A display of stunting by Flt. Lt. A. C. Collier, a demonstration of " how not to fly " by Sq. Ldr. J. Noakes (the inventor of crazy flying), a demonstration on the Autogiro by Senor Don Juan de la Cierva (the inventor of this re



A GIFT TO THE COMMONWEALTH.—The Avro Avian (Cirrus Mark II engine) presented by Sir Charles Cheers Wakefield to the Federal Government of Australia. This machine was handed over by Mr. Bruce to the Australian Aero Club, New South Wales Section, on March 31 at the Mascot Aerodrome. Before delivery it was erected and tuned up by the Larkin Supply Co. Ltd., who are the Australian agents for A. V. Roe and Co. Ltd. The machine is seen outside the firm's sheds at the Melbourne Aerodrome.

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markable machine), an exhibition of upside-down flying by Flt. Lt. Rawson, a demonstration of the capabilities of the Avro Avenger by Flt. Lt. F. Luxmoore, and a demonstration of stalled flight by Mr. H. Broad, on a De Havilland Moth, and Mr. S. Brown, flying an Avro Avian, to show the effectiveness of the Handley Page slot device for the prevention of stalling and spinning, are other items which may be mentioned.

In addition there will be four handicap races for challenge trophies. The entries are so numerous that it has been decided to hold eliminating heats on Whit-Sunday afternoon.

This year a short course for the racing events has been chosen. Each race will be flown over several laps of this course, and the machines will be within sight of the spectators for the whole distance. This will greatly add to the interest of these events.

Most of the best-known pilots in the country are competing, and it is of interest that at least four women pilots will take part in the racing.

Lord Montagu of Beaulieu will act as judge for the racing, and Air Vice-Marshal Sir Sefton Brancker will be one of the Stewards.

All aircraft taking part in the meeting—and upwards of one hundred machines of various types, including an Imperial Airways air-liner from Croydon, are expected—will arrive at the aerodrome on Whit Sunday. The aerodrome will be open to the public for joy-riding on Sunday at a small charge for admission.

A full licence for the sale of wines and spirits has been obtained for both Sunday and Monday. Canteens will be open to the public from 12.00 to 19.00 hrs. on both days. Adequate arrangements have been made for catering, and visitors will be able to obtain lunch and tea at reasonable prices.

Improved travelling facilities will ensure everyone being able to reach the aerodrome in comfort and without delay. Special road and rail services at cheap rates will be run to and from the Aerodrome or Netley Railway Station on the day of the Pageant. The first event, a parade and fly past of aircraft, is timed for 14.15 hrs., and the Pageant will end by six o'clock.

THE SLOT ON THE CONTINENT.

On May 10 Sq. Ldr. T. H. England left Cricklewood in a Moth (Cirrus engine) on a tour of Europe, the object of which is to demonstrate the Handley Page slot to the various aeronautical interests of Europe. He flew to Le Bourgêt and thence to Villacoublay, the aerodrome of the French *Service Technique et Industriel de l'Aéronautique.*

Here he remained for a week demonstrating the Moth to all who desired to see or investigate it. The machine during this period was flown by a large number of pilots, both those attached to the French official Services, and test and other pilots representing aircraft constructing firms.

All these expressed their amazement at the controllability and general performance of the slotted Moth, so much so, that one very well-known constructor has decided to enter into negotiations for a licence to build similar machines in France.

On May 17 Sq. Ldr. England left Villacoublay and reached Bordeaux in the evening after a forced landing near Poitiers. The engine cut-out nearly completely over densely-wooded country, but fortunately, "suddenly finding 1,400 revs. from somewhere" made possible a safe landing in a reasonable field. The cause of the trouble was found to be sooted plugs caused apparently by a brand of petrol which did not suit the carburettor of the Cirrus engine.

On the following day in rain, and strong head-wind, and clouds at 200 feet, Biarritz was reached. In a letter from this place Sq. Ldr. England mentions that clearance from Customs before entering Spain from this aerodrome costs a small fortune, and that it is necessary to send into the town for petrol because there is none at the aerodrome.

Continued bad weather made it impossible to attempt to cross the mountains into Spain on May 19.

The weather remained inclement on May 20, and in addition Sq. Ldr. England was afflicted by a slight attack of influenza, but both sets of adverse conditions improved on May 21, when the journey to Madrid was made without incident.

BRIGHTER AFRICA.

Lady Heath, formerly Mrs. Elliott Lynn, arrived at Croydon in an Avro Avian on May 17, having left Cape Town on Feb. 12.—Thus, in spite of the length of time taken, she acquired the distinction of being the first woman to pilot an aeroplane from Cape Town to London.

Her actual itinerary after leaving Cape Town and before leaving Rhodesia is difficult to trace, as news of her exhibitions came from several different places, without reports of her flights from place to place.

On May 17 the correspondent of *The Daily Express* in Paris sent the following account of Lady Heath's arrival at L Bourgêt :—

Lady Heath, formerly Mrs. Elliot Lynn, stepped out of her ti Avro Avian airplane at Le Bourget this morning after her long flig from Capetown, as fresh as a daisy. "It is so safe," she said, "th a woman can fly across Africa nowadays wearing a Parisian fro and keeping her nose powdered all the way. You don't believe m Look at my frock. Look at my nose.

"*I do not think any woman ought to allow herself to become ca less even while flying, and when I started on this 10,000-mile flig I made a vow that I would not let even a native see me with a shi nose.*

"Really it was not hard. When my powder blew off I simp clamped the joy-stick between my knees, held my mirror with o hand and powdered with the other, and I did it many a time wi a lion, a giraffe, or a herd of elephants gazing up at me."

Commenting on the paragraph printed in italics, "Beac comber" of *The Daily Express* wrote on May 18 :—

There is a poem in Mr. Kipling's earlier manner hidden away this vow.

The woman aviator then went on to describe how she frequent powdered her face in mid-air, with a herd of elephants gazing up her.

If it be true that elephants never forget, there will be some go jungle tales for the next hundred years or so.

The large concourse of Advanced Feminists who we expected to greet Lady Heath at Croydon did not arriv But she was well received by the employees of the local ai lines and others indigenous to that suburb.

A WEEK-END PARTY.

Mr. and Mrs. Fitzgerald, of Marsden Manor, Cirenceste gave a house-party last week-end, to which all the gues arrived by air. These were Capt. and Mrs. Geoffrey Havilland (Moth), Mr. and Mrs. Nigel Norman (slott Moth), Mr. and Mrs. Muntz (slotted Moth), Mr. and M Butler (Moth), Mr. Norman Jones (Moth), and Dr. Whiteh Reid (Widgeon).

All the guests landed in the grounds and the machin were housed in the ordinary car garages.

On Sunday they all flew off to Lambourne Down for picnic and returned to Cirencester in the evening.

On Monday they all flew back to London without misha

THE R.A.F. DISPLAY AND THE FLYING CLUBS.

The R.A.F. Display Committee have decided to all members of Flying Clubs to have two tickets for the r enclosure at the R.A.F. Display on June 30 for the price one. Exactly why people who are sufficiently well off to able to indulge in the rather expensive pastime of cl flying should be given tickets for the R.A.F. Display, t proceeds of which are devoted to the R.A.F. Memorial Fu one cannot quite understand, but one presumes that memb of Flying Clubs are at liberty to pay for all the tickets th take if they wish so to do.

The attention of Club Committees is called to the fact t most of the Railway Companies are issuing excursion tick for the Display this year, and if the Flying Clubs can arra parties of their members and friends to visit the Display, t Railway Companies will arrange special trains. The D play Committee have approached the Railway Companies this subject but the Companies will not run special tra unless a certain number of passengers are guaranteed. The fore it is up to the Flying Clubs to see that their memb arrive at Hendon in good time for the beginning of the D play and have a convenient train for their return.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: H. E. Perrin, 3, Clifford Street, London, W.1.]

Report for week ending May 20.

Flying Time 25 hr. 20 min. *Instruction* 12 hr. 10 min. *Soloists* 13 10 min. *Instruction.—With Mr. S. L. F. St. Barbe*—Miss Johnson, E. G. Amsden. *With Mr. F. R. Matthews*—Messrs. E. R. Andre R. Drysdale Smith, J. Bickley, A. J. Miller, B. L. Middelton. *Soloist* Major K. M. Beaumont, Lieut. E. L. D. Moore, Messrs. J. C. V. Watson, A. J. Richardson, F. C. Fisher, R. Sanders Clark, J. Brewster, P. W. Hoare, E. R. Andrews, J. H. Saffery, H. B. Mic more, G. J. C. Paul.

The Newcastle-upon-Tyne Aero Club.

[Sec.: Cramlington Aerodrome, Northumberland.]

Report for week ending May 20.

Flying Time 28 hr. 50 min. *Instruction* 7 hr. *Soloists* 1 hr. 50 m "*A*" *Pilots* 18 hr. 20 min. *Passengers* 30 min. *Tests* 1 hr. 10 m *Instruction.—With Mr. Parkinson*—Miss Klyver, Miss Rambaut, C Lynden Bell, Messrs. Hayton, Cochrane Carr, Redshaw, Tem Mechan, W. J. Brown. *Soloists.*—Mr. Redshaw, Dr. Alderson. " *Pilots.*—Mrs. Heslop, Dr. Dixon, Messrs. Lloyd Browne, R. N. Tho son, C. Thompson, Runciman, J. D. Irving, Wilson, Brooks, N. Todd, Baxter Ellis, P. F. Heppell, Turnbull. *Passengers carried.*—

Mr. F. W. Redshaw carried out his first solo on Thursday, putt up a good show.

Mr. R. N. Thompson and Mr. Lloyd Browne flew to Sherburn Saturday to attend the opening of the Yorkshire Club's new C house. Owing to the exceedingly bad weather, which spoiled meeting, they were unable to return until Sunday morning. members of the Club trust that Yorkshire will be more fortunate

HAMPSHIRE AIR PAGEANT

WHIT MON., MAY 28th.

Organised by Hampshire Aeroplane Club.

AIR RACING AND
DISPLAY BY R.A.F.

Full particulars from Secretary. Flying Entries by May 14th.

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future meetings they hold with regard to weather, in which they appear to have ill luck always.

Mr. M. Bainbridge flew the D.H.53, G-EBTT, to test with a view to purchase.

Mr. Lines landed in Avian WU for petrol on Tuesday and Wednesday, in the course of his journey to and from Berwick, where he collected photographs taken at the ceremony of opening the New Bridge.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending May 19.

Flying Time 21 hr. 15 min. *Instruction* 6 hr. 55 min. *Soloists* 13 hr. 30 min. *Passengers* 50 min. *Instruction.—With Mr. Beck*—Messrs. Bell, Blackburn, Daly, Fitton, Harral, Ives, Ostler, Reynolds, Roberts, Senior. *With Mr. Stockbridge*—Mr. Ostler. *Soloists.*—Messrs. D. Atcherley, Dick. *"A" Pilots.*—Messrs. Ambler, Clayton, Ellison, Humpheries, R. Lax, Lister, Mann, Norway, Thomson. *"B" Pilot.*—Mr. Loton. *Passengers carried.—7.*

The outstanding event of a rainy week took place in a torrential downpour yesterday when the Club-house was officially opened by the President, Col. Sir Edward Brotherton, Bart., LL.D., D.L., who commemorated the occasion by a further generous donation of £100 to ease the financial position of the Club.

The Berkshire Aviation Tours Ltd. sent a machine with Mr. Rimmer, who kindly gave an exhibition of aerobatics and flew the machine for a demonstration of wing-walking. Messrs. Thompson and Brown came down from Newcastle and kindly treated several members of the Club to a pleasurable trip in a Moth.

The President was greeted on his arrival by a close formation of the Club's three Bluebirds which followed his car along the road from Garforth and gave him a diving salute as he stepped out of his car in front of the Club-house door. The continuous downpour of rain completely damped the ardour of many present who would have cheerfully flown had the sun been shining. The ceremony was concluded in the usual manner appertaining to wet Yorkshire Pageants.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending May 19.

Flying Time 24 hr. 25 min. *Instruction.—With Flt. Lt. Rose, D.F.C., and Mr. W. H. Sutcliffe*—Capt. H. Tower, Capt. J. C. Chaytor, Messrs. G. E. C. Hill, M. Turner, S. Duckitt, H. Coleman, T. H. Drury, R. C. Baxter, H. Beamish, J. Cobb, S. Rowley, E. P. Lane, C. W. Fellowes, H. J. Willis, H. Tipper, S. Hall, W. M. Morris, E. J. Brighton, R. L. Jackson. *Soloists.*—Messrs. R. D. Bednell, S. H. Smith, J. Rowley, H. Tipper, W. M. Morris, E. P. Lane, S. G. Hall, E. J. Brighton, R. L. Jackson, H. J. Willis, G. Robson, E. D. Wynn, C. W. Fellowes. *Passenger Flight.*—6.

On Sunday Messrs. W. M. Morris and H. Tipper passed all tests for their "A" Licence.

"LT" has been out of commission during the week for general overhaul.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, Hamble Aerodrome, Southampton.]

Report for week ending May 20.

Flying Time 31 hr. 25 min. *Instruction* 11 hr. 55 min. *"A" Pilots* 9 hr. 40 min. *Soloists* 4 hr. 25 min. *Passengers Flights* 4 hr. 20 min. *Tests* 1 hr. 5 min. *Instruction.—With Flt. Lt. F. A. Swoffer.*—20. *Passengers carried.*—22.

Sir T. Munro did a very successful first solo on Tuesday, and Mr. Powell carried out his tests for his "A" Licence. High winds and rain have very considerably reduced our activities this week. We are hoping that they will not interfere with our Pageant on May 28. All the arrangements are now well in hand and visitors are assured of a most excellent show.

Mr. Schrieber's first solo was very successful as far as the circuit and landing was concerned, but he was not so successful when he tried to taxy through the posts that have been erected for the enclosures for the Pageant. The posts got the better of the argument over the starboard wing.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston, Norwich.]

Report for week ending May 20

Flying Time 8 hr. 35 min. *Instruction.—With Mr. Young*—Messrs. H. Neave, E. Varden Smith, E. Lambert, H. P. Clarke. *Soloists.*—Messrs. N. Brett, G. Barker, W. A. Ramsey, G. F. Surtees, R. T. Harmer, F. Gough, W. P. Cubitt, R. F. Potter, E. Lambert. *Passengers carried.—7.*

The Annual General Meeting is to be held on June 8, at the Royal Hotel, Norwich. Shareholders 7.30 p.m., members 8 p.m. All directors retire and become eligible for re-election; after this year only one-third of the directors retire annually.

One regrets to report very slow progress in regard to Mr. Birchall; he has now been in hospital for 5½ weeks and yet his leg is still in grave danger. His pluck is extraordinary and is much admired by members of the Club.

Mr. Young is welcomed to our household this week; the steady growth of the Club necessitated a further appointment, thus Mr. Young becomes Chief Instructor and Club Manager.

An Anniversary Booklet has been issued to celebrate our first birthday; this sets out in admirable manner for how and when and why the Club started, and gives a little well-deserved credit to those good people who did such a lot of hard work at the start. Anybody interested may have one on application to the Club Secretary.

The weather has been simply appalling, utterly impossible for flying for five consecutive days.

The Prince of Wales's visit on May 30 is indeed a "Leading Show." The De Havilland Co. have sent out a clarion call to Moth owners with most wonderful results. All aeronauts will be welcome on Wednesday next.—F. G.

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending May 19.

Flying Time 15 hr. *Instruction* 8 hr. 15 min. *"A" and "B" Pilots* 2 hr. 15 min. *Soloists* 1 hr. 10 min. *Passenger Flights* 2 hr. 45 min. *Tests* 35 min. *Instruction.—With Mr. Lowdell*—Dr. Mildred Yate, Miss Rhodes, Miss Edwards, Mrs. Young, Dr. Dunn, Messrs. Billinton, Goodwin, Marriage, Smith, Hanson, Verney, and Flg. Off. Birt, R.A.F. *"A" and "B" Pilots.*—Dr. J. C. Sleigh, Messrs. Prentice and Schofield. *Soloists under instruction.*—Miss Edwards, Flg. Off. Birt, Messrs. Hanson, Smith, and Verney. *Passengers with Mr. Lowdell.*—10. *With Mr. Prentice.*—6.

Two propaganda flights for the purpose of increasing airmindedness in East Anglia were carried out during the week. On Tuesday, Miss Edwards and Mr. Lowdell flew over to Halesworth, and on Friday, Mr. Jolly and Mr. Lowdell flew over to Diss. A landing was made at both places and a large number of people were given an opportunity to inspect an aeroplane at close quarters for the first time. Such trips appear to arouse great interest and they certainly do a vast amount of good in the cause of aviation.

This week the Club has broken all its previous records with regard to flying time, despite the fact that the weather was none too good and several members who are under instruction were away. This is a sure proof of the steady growth in size and vitality of the Club.

The Club will be closed from May 24 to May 31. Both machines go to Hamble on Saturday and return on Tuesday. They will be flown by Mr. C. N. Prentice and Mr. G. E. Lowdell, A.F.M. The headquarters of the Club from Saturday to Tuesday will be The Red Lion Hotel, Fareham, Hants.

On May 30 both machines will go to Norwich, piloted by Dr. J. C. Sleigh and Mr. Lowdell, to take part in the Display and the inspection by H.R.H. The Prince of Wales, K.G. It has been arranged that Mr. Lowdell shall give an exhibition on the Genet-Bluebird of aerobatics and upside-down flying during the afternoon.

The Cinque Ports Flying Club.

[Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

Report for May 19 *and* 20.

Flying Time 5 hr. 20 min. *May* 19.—*Test Flight* 5 min. *Instruction.—With Mr. Lines*—Mr. Story 30 min., Lt.-Cdr. Gubbins, R.N., 30 min., Mr. R. Dallas Brett 15 min., Mr. Douglas 15 min., Mr. Boys 15 min., Mr. Maurice Braddell 15 min. *May* 20.—Mr. R. Dallas Brett 30 min., Mr. Story 30 min., Mr. Maurice Braddell 45 min., Mr. Boys 30 min., Lt.-Cdr. Gubbins, R.N., 30 min., Mr. Douglas 15 min. *Joy-riding with Mr. Lines.*—Capt. L. A. R. Braddell 15 min.

Mr. G. F. Lines very kindly came down to give the members instruction over the week-end. He arrived with Mr. Sutton in an Avro Avian, and we managed to put in 5 hr. 15 min. flying on the two days. Everyone is very grateful to Mr. Lines for his voluntary assistance.

On Sunday, Mr. Neville Stack turned up again in his Moth, G-EBUF, to visit the Club.

The Club has been fortunate in securing the services of Flg. Off. Irwin Napier Colin Clarke, D.S.C., R.A.F.O., as Pilot Instructor to the Club.

He joined the R.N.A.S. in August, 1915, and has flown continually since, putting in 2,800 hours. During the War he served overseas at the Dardanelles, Dunkirk, and on the Ypres Front. At the end of the War he was appointed to command Joyce Green Aerodrome. In 1921 he was appointed to the Australian Air Force as Chief Instructor, with the rank of Squadron Leader. He rejoined the R.A.F. in 1923 and served at home and in 'Iraq until 1926, when he was posted to Henlow, where he served until January of this year, when he passed to reserve.

He will take up his duties on May 25, after which flying instruction will be given every day except Tuesday.

The Sydney Flying Club.

The Club's Chief Instructor, Capt. E. W. Leggatt, M.C., was chosen for, and offered, the post of Superintendent of Flying Operations with the Department of Civil Aviation, but he has decided to remain with the Club.

For the week ending Mar. 1 the Club put up a total of 115 hours' flying, which is claimed as a record for any Flying Club in the British Empire.

On two previous occasions this year the weekly flying time has exceeded 100 hours, i.e., on weeks ending Jan. 26 and Feb. 2, when the total on both occasions was 100 hr. 55 min.

The attention the Club pays to its bye-laws is instanced by the case of a member who was reported to have indulged in low-flying over a populous area. A special committee meeting was called and after hearing the pilot, the Committee decided to ask for his resignation from the Club, which was duly tendered and accepted.

On Mar. 31 the Club held an Aerial Pageant at Mascot Aerodrome, which is reported elsewhere.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending May 20.

Flying Time 105 hr. *Instruction.—Dual* 28 hr. 15 min. *Solo* 69 hr. *Other Flying* 7 hr. 45 min.

Work on the School was greatly curtailed owing to the consistently stormy weather which prevailed, nevertheless three pupils carried out tests for "B" Licences, including Mr. A. S. Butler, Chairman of The De Havilland Aircraft Co. Ltd., who successfully passed the night-flying test at Croydon Aerodrome.

Six new Moths were "introduced to the atmosphere" during the week.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending May 17.

Flying Time 30 hr. *Instruction.—With Lt.-Col. G. L. P. Henderson*—Miss Kidston, Messrs. Bellville, Brooks. *With Mr. H. D. Davis*—Dr. Forsyth, Dr. Wall, Messrs. Raymond, Quilter, Art. Fowler, Moss, Hughes, Oliver, Allen, Barclay, Saunders, Murray-Philipson, Hamilton, Payne. *Soloists.*—Dr. Wall, Messrs. Oliver, Murray-Philipson, Patton-Bethune, Hamilton, Allen, Barclay, Hsiao.

Col. Henderson sent Mr. Bellville solo on Sunday and the flight was completed with the usual three-point landing.

The School will be open on Whit-Saturday and Sunday, but closed on Bank Holiday Monday.

Our machines will be flying at Hamble Air Meeting, piloted by Col. Henderson, Capt. H. D. Davis, and Capt. Davenport.

LADY HEATH'S FLIGHT
was carried out on
Wakefield Castrol

Lady Heath, who flew home from the Cape on a "Cirrus" engined Avro "Avian," cabled:

CASTROL HAS GIVEN REMARKABLE RESULTS——PRESSURE NEVER DROPPED A POUND AND CONSUMPTION REMAINED CONSTANT EVEN WHEN THERMOMETER CARRIED REGISTERED HUNDRED TWENTY FAHRENHEIT——SIMILAR ENGINES USING MINERAL OIL ON SAME ROUTE CONSUMPTION TREBLED OWING THINNESS IN HEAT

HEATH

Wakefield CASTROL was used in the first aeroplane flight across the Atlantic—the flight of "R.34" to America and back—the first direct flight across the South Atlantic, and in many other great flights, including the recent 35,000 miles World Flight of Messrs. Costes and Le Brix, and Mr. Hinkler's 15½ day flight to Australia.

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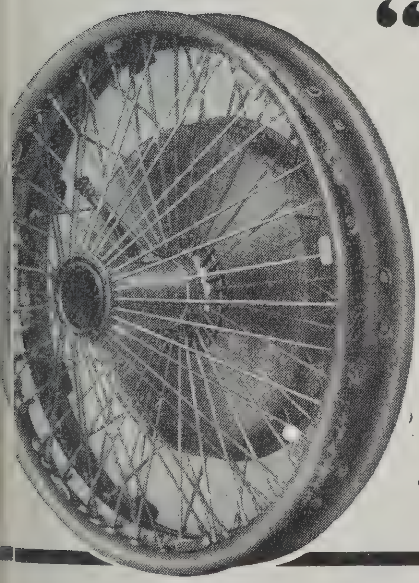

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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 13; Monday, 32; Tuesday, 27; Wednesday, 28; Thursday, 31; Friday, 25; Saturday, 28.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 69, passengers 497, freight 18 tons.

Air Union:
Paris—London: Machines 44, passengers 164, freight 14 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 24, passengers 34, freight 6½ tons

Sabena:
Brussels—London: Machines 14, passengers 41, freight 1½ tons

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 28, passengers 43.

Private:
Machines 5, passengers 3.

Total number of trips by British Machines, 74, carrying 502 passengers. Foreign Machines, 110, carrying 382 passengers.

COMPARATIVE FIGURES.

Week ending May 20:
Machines, 184; Passengers, 884; Crews, 346; Total personnel, 1,230.

Corresponding week, 1927:
Machines, 134; Passengers, 614; Crews, 217; Total personnel, 831.

Corresponding week, 1926:
Machines, 136; Passengers, 624; Crews, 174; Total personnel, 798.

Corresponding week, 1925:
Machines, 127; Passengers, 493; Crews, 152; Total personnel, 645.

Corresponding week, 1924:
Machines, 81; Passengers, 271; Crews, 130; Total personnel, 401.

Corresponding week, 1923:
Machines, 105; Passengers, 353; Crews, 175; Total personnel, 528.

Corresponding week, 1922:
Machines, 162; Passengers, 337; Crews, 195; Total personnel, 532.

Corresponding week, 1921:
Machines, 89; Passengers, 350; Crews, 106; Total personnel, 456.

Corresponding week, 1920:
Machines, 91; Passengers, 138; Crews, 98; Total personnel, 236.

Croydon Notes.

Every new method of transport in its earlier stages has suffered from the innate distrust of new-fangled methods characteristic of humanity, and has had to encounter a period of arrested development during which the public generally has slowly come to regard it as a normal method of travelling The lady passenger who on arriving at Croydon from the Continent at once inquired what discount could be allowed if she purchased sixty tickets in one lot for her own personal use is an encouraging sign that some people at least are ready to regard flying as an everyday method of getting about.

With all due respect to the excellent work which Imperial Airways have done in the interests of Aerial Transport generally it has never seemed that their publicity department has been very effective as a propagandist organisation. Therefore the appearance at Croydon in one week of two new posters advertising their service seems to be an event worthy of note.

Of these two posters, one, by that master of poster art John Hassall, is really delightful, and will, it may be hoped, be widely exhibited. The other, which depicts a British lion looking out over the sea, and bears at the top the word "Reliability" and at the bottom the legend "Imperial Airways," is scarcely so happy. The lion has his tail well down and wears a somewhat surly and hungry look, which is scarcely reassuring enough to consort well with the inscription above him.

Lady Heath's Avian now at the A.D.C. Works is naturally looking a little travel-worn after its trip home from South Africa. But so far as essential structure is concerned it is in surprisingly good condition, and the Cirrus engine is in such excellent order that the owner has repeatedly directed that it is to be left alone.

The only parts of the machine that appear to need repair are the cowling round the front cockpit, the lid to the locker behind the rear seat, and the diagonal rib across the port bottom wing root. The latter has fairly obviously suffered some accident and has been rather roughly repaired. The damage to the cockpit and locker cowling is evidently the result of the abnormally hard wear to which the machine has been subject. Altogether the state of the machine is an excellent advertisement for the design and the quality of materials and workmanship of the Avian.

On Saturday Lord Carbery's Fokker Universal arrived bearing Sir Piers Mostyn from Nairobi. Arrivals at Croydon ex Africa have now ceased to be anything new.

MR. VAN LEAR BLACK'S TOUR.

Mr. Van Lear Black, who left Croydon Aerodrome on May 14 on the Fokker F.VII-3m (three Bristol Titan engines), piloted by Messrs. Geyssendorffer and Scholte, of the K.L.M., reached Khartum on the afternoon of May 19.

On the first day out from Croydon Venice was reached after an intermediate landing at Geneva. May 15 was spent at Venice, Brindisi was reached on May 16, Athens on May 17, Cairo, via Sollum, on May 18, and Khartum on the following day, May 19.

At this place a halt was made, and up to the time of going to press no news of any further progress has been received.

A CROSS-CHANNEL AIR SERVICE.

On or about July 15 the *Compagnie Aérienne Française* intends to open a cross-Channel air service from Calais to Dover. The service will run in connection with the boat trains and the crossing will take only a quarter of an hour.

The French terminus will be in the Calais dock about 100 yards from the Maritime Station and the English station will be within the outer breakwater on Dover harbour.

It is intended to use four or five small seaplanes each carrying two or three passengers.

GERMAN CIVIL AVIATION.

The Deutsche Lufthansa A.G. announces that for 1927 it made a gross profit of 7,000,000 marks (£350,000). The greater part of this sum is applied to settlements and depreciation and the balance of £950 has been placed to reserve.

ANOTHER ZEPPELIN RAID.

The Air Ministry has been approached by the German authorities to know whether facilities can be afforded for the new Zeppelin airship LZ-127 to use the mooring mast, and, if desirable, one of the sheds at the Royal Airship Works at Cardington.

A reply has been sent stating that mooring facilities will be provided but that the use of a shed depends on whether such is available at the time of the visit of the LZ-127. At the present moment the only big shed at Cardington is being used for the construction of R.101. Another shed is nearing completion alongside, but this is not expected to be ready by July, which has been suggested as the earliest possible date for the visit of the LZ-127.

SIR ALAN COBHAM'S PROGRESS.

After a delay of several weeks at Fresco, on the French Ivory Coast, owing to a defective radiator, Sir Alan Cobham and party left this place at dawn on May 15 in the Short Singapore (two 650 h.p. Rolls-Royce Condor engines) and flew to Freetown, Sierra Leone.

His machine was the first aeroplane to be seen in Sierra Leone, and his arrival caused tremendous enthusiasm among the residents and natives.

On May 19 he flew from Freetown to Bathurst, Gambia. While at Freetown it was found necessary to clean the hull of the Singapore which had become fouled during its long stay afloat in Fresco Bay.

Sir Alan Cobham, as at present arranged, is due to arrive at Plymouth at the end of this month and he will then make a tour of the leading seaports and coast towns of Great Britain with the object of stimulating interest in the commercial development of the flying-boat.

THE ITALIAN POLAR EXPEDITION.

On May 18, the Italian airship *Italia* returned to King's Bay, Spitzbergen, thus concluding its first prolonged flight over the Polar regions. In a flight lasting 67 hours a distance of 2,700 miles was covered in patchy weather.

Nicolas II Land, to the N. of Siberia, which was the object of the flight, failed to reveal itself. Apparently it was hiding, for very shame, under its new name, Leninland.

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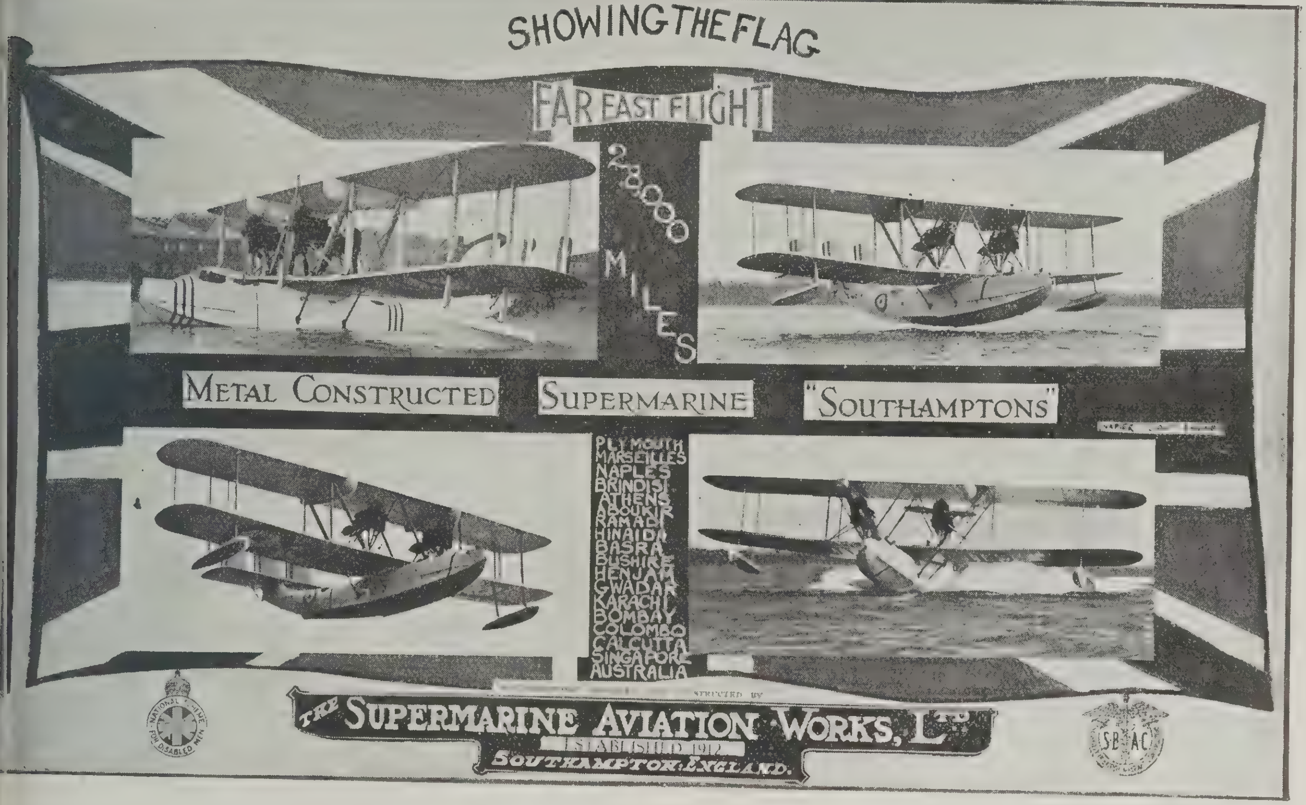

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Letters have been received by The Aeroplane from Capt A. Weir-MacColl (Chief Pilot, Engineer, and Director) from Mr. Reginald Schlotel (Technical Manager and Director), and from Mr. M. W. Wood (Technical Manager), stating that they have resigned from all their positions with the firm known as British Airships Ltd.

A RELIABLE CASTING ALLOY.

Few branches of engineering uses so wide a diversity of structural materials as are used in aeronautical work, and the aeronautical engineer has no easy task in keeping himself properly acquainted with all the possible materials. There is very little doubt that in some cases the choice of material and the method of manufacture of a given component for aircraft purposes is settled because the particular designer or draughtsman responsible is familiar with the chosen material and its working rather than because it is the best possible material.

Aluminium alloys in the cast state are as a whole not very widely used in this country for aeronautical work except for crankcase and similar components in engines, largely because in the ordinary way aluminium castings require very skilled and careful foundry work, and are even then not overwhelmingly reliable.

Alpax—a heat-treated aluminium-silicon alloy—has been widely used on the Continent, and to a considerable extent in this country, in the form of castings for aircraft and aero-engine work and has proved itself to be greatly superior to the general run of light alloys in physical qualities, and in reliability. There must be many structural details now either machined from the solid or built-up which could economically be replaced by Alpax castings and all those who have to decide upon methods and materials of production of aircraft components should write to Lightalloys Ltd., Alpax Works, St. Leonards Road, London, N.W.10, for a copy of their pamphlet, "Alpax," which gives an account of the qualities of this material in a form which will appeal to the practical man.

"Alpax" satisfies the requirements of Air Ministry Specification D.T.D.25.

A CANADIAN AVIATION PAPER.

Canada is to be congratulated on the production of *Aircraft and Airways*, by Captain Albert H. Munday, late R.A.F. For a long time there has been a need of an aviation paper in Canada, first of all to educate Canadians in what is being done elsewhere, and secondly to record what is being done in Canada.

This first issue, the Inauguration Number, carries the blessings of Major-General J. H. MacBrien, C.B., C.M.G., D.S.O., Chief of Staff, Dept. of National Defence, who is not only a distinguished soldier but a leader of political thought in Canada. He is also president of the Aviation League of Canada. Capt. Earl M. Hand, D.F.C., president of the Toronto Flying Club, also gives the paper a good send-off.

Major-Gen. MacBrien contributes an extremely interesting article on the Future of Aviation in Canada. This should certainly be read by everybody in this country who hopes to do business in Canada either in the way of selling machines or by going out there as a pilot or mechanic.

The paper is exceedingly well printed and produced, and one hopes to see in future issues a great deal more news of actual flying in Canada. Capt. Munday's own leading articles are full of sound common sense.

The subscription rate is 1 dollar for 5 months or 2 dollars for 12 months, and specimen copies may be obtained from *Aircraft and Airways*, Central Building, Toronto, Ont.

FIT AND FORGET.

In these days practically every aeroplane in this country is fitted with K.L.G Plugs. But in case anybody should need any more convincing, the following letter from Mr. Neville Stack supplies a further valuable argument in favour of K.L.G.s :—

> Having just completed a 4,500 miles' tour for *The Daily News* through France, Spain, Morocco, Algiers, Tunis, across the Mediterranean to Sicily, Italy and back to England, I wish to congratulate you upon the remarkable reliability of your sparking plugs. During the flight, the plugs have carried on as long as 16 hours without being cleaned, and have always functioned perfectly. It is a noteworthy fact that the same set of plugs have been used throughout the flight, and no change made.
>
> I would also like to state that during the flight from London to Delhi, India, a year ago, in company with Mr. B. M. S. Leete, using two "Cirrus" engined "Moths," we fitted K.L.G. plugs which gave us every satisfaction throughout the flight.
>
> Once again congratulations on a perfect plug.
>
> (Signed) T. Neville Stack.

PERSONAL NOTICES.

Deaths.

BRADBURY.—On May 20, in hospital, as the result of a flying accident on May 8, Geoffrey Bradbury, Flg. Off., No. 41 (Fighter) Sqdn., R.A.F.

Mr. Bradbury entered the R.A.F. with a short-service commission in September, 1925, and after a course of flying instruction at No. 5 Flying Training School at Sealand was posted to No. 41 (Fighter) Squadron. He was promoted to be Flying Officer in March, 1927, and re-posted to No. 41 Squadron for air armament duties.

DREW.—On May 21, at Paisley, as the result of a flying accident, James Pearson Drew, Plt. Off., No. 602 (City of Glasgow) (Bombing) Squadron, Auxiliary Air Force.

Mr. Drew, who joined the Auxiliary Air Force in July, 1926, was flying a machine belonging to the Scottish Flying Club.

Forthcoming Marriages.

HAMMOND—SWETE.—The marriage arranged between Flg. Off. Alfred Vavaseur Hammond, and Marjorie, daughter of Mr. and Mrs. Gerald Swete, of Dennington, The Ridgeway, Woking, will take place on June 12, at 2.30 p.m., at St. Mary's, Horsoll, Woking.

HAMPTON—BODIMEADE.—An engagement is announced between Flt. Lt. H. N. Hampton, D.F.C., R.A.F., elder son of Mr. and Mrs. S. T. Hampton, of Bishop's Stortford, and Miss Marjorie Bodimeade, elder daughter of Mr. and Mrs. F. E. Bodimeade, of Kenton, Harrow.

PEARSON—POTTER.—The marriage arranged betwepen Mr. John Maclaren Pearson, late Cameronians and R.F.C., second son of the late Mr. C. J. B. Pearson and Mrs. Pearson, and Bettine Marie Hamilton, elder daughter of Major Cyril Potter and Mrs. Potter, of Blakes, Lymington, Hants, will take place at 2.15 p.m. on June 2, at St. John's, Boldre.

WOODIN—BYGOTT.—The engagement is announced, and the marriage will shortly take place, between John Horton Woodin, Flg. Off. R.A.F., elder son of the Rev. Stanley H. Woodin, M.A., and Mrs Woodin, of Yarmouth Rectory, Isle of Wight, and Joyce Mary Bygott of 26, Sussex Mansions, S.W., widow of H. C. Bygott.

Births.

INGLIS.—On May 16, at Manor Cottage, Stoke Mandeville, Bucks, to Vera (*née* Turner), wife of Flt. Lt. F. F. Inglis, R.A.F.—a daughter

LUXMOORE.—On May 14, at Parson's Mead, Beaulieu, to Dorothy wife of Flt. Lt. F. L. Luxmoore—a daughter.

RANKIN.—On May 20, at 23, Lilybank Gardens, Glasgow, W.2, to Rhoda Gillatt, wife of Alexander C. Rankin, M.C., D.F.C.—a daughter

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THE BRITISH AIR LINE TO THE CONTINENT.

WHAT THE DOMINIONS WANT.

An aviation enthusiast in Southern Rhodesia, who is looking forward to the day when air transport will bring him nearer civilisation, writes :—

> Good luck to you in your efforts to get British manufacturers to produce real commercial machines before the Americans get in, here and in other Colonies.

Perhaps this will help a little more towards convincing British aircraft constructors what the Dominions want.

AN OFFER OF CHEAP ENGINES.

Gilbert and Langley Ltd., of 75, Victoria Street, London, S.W.1, offer for sale a number of Rolls-Royce Condor Series II engines at a price of £500 each. These engines are new and unused, except for the makers' bench trials, and are in excellent condition.

The Condor Series II is fitted with the original Rolls-Royce epicyclic type of reduction gear, develops 650 h.p. at 1,900 r.p.m. of the crankshaft and 1,055 r.p.m. of the airscrews and weighs dry 1,400 lbs.

These particular engines were made for and purchased by the R.A.F., but as the Series II was superseded by the Series III Condor they were never put into service, and have since been sold.

Gilbert and Langley Ltd. suggest that these engines are eminently suitable for use on airscrew-driven hydroplane boats, etc., and there is little doubt that many other uses could be found for them at the price at which they are now offered.

THE SPECIAL R.A.F. ISSUE.

A few copies of the special R.A.F. issue of THE AEROPLANE which appeared on April 4 are still available and may be had for 7½d. each post free from THE AEROPLANE, 14, Bream's Buildings, E.C.4.

This issue, which was published to celebrate the tenth nniversary of the formation of the Royal Air Force, contains messages to the R.A.F. from the Secretaries and Under-Secretaries of State for Air from 1918 to 1928; a leadng article on the Tenth Birthday of the R.A.F.; a summary f the chief events in the history of the R.A.F. during the rst ten years of its existence; an article on Single-seat ighters in 1918 and 1928; thirty-six new photographs and rawings of the R.A.F. of yesterday and to-day, and the sual illustrated news pages.

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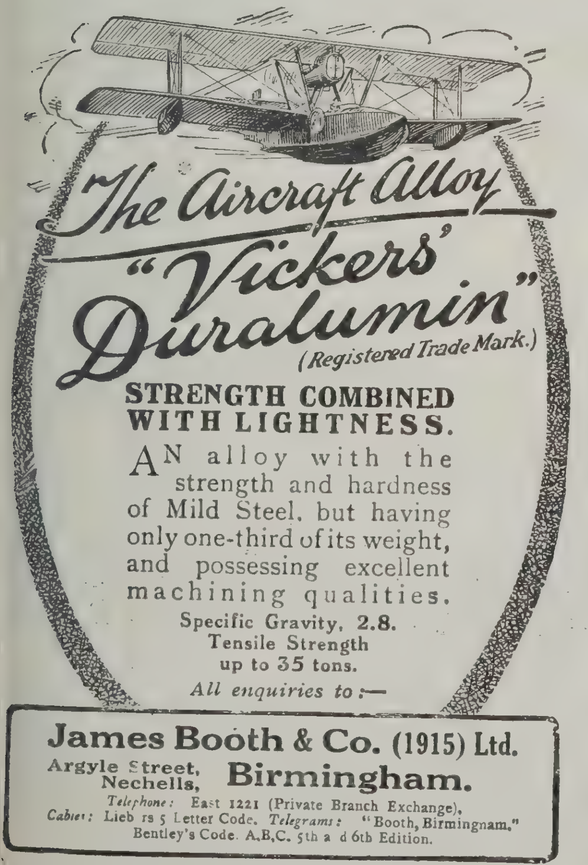

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Air Survey Company Ltd., 3, Copthall Buildings, E.C.2. L.W. 9850. 39, Grosvenor Place, S.W.1. (Sloane 6048), and Monkey Point, Rangoon.

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All seeking Aviation Employees or Employment should communicate with Capt. Warren Merriam, A.F.C., A.F.R.Ae.S., Aviation Agent. His Employment Bureau is authorised and licensed by the L.C.C. 64, Victoria Street, S.W.1. 'Phone Victoria, 8428, Cables, Airmerriam, London.

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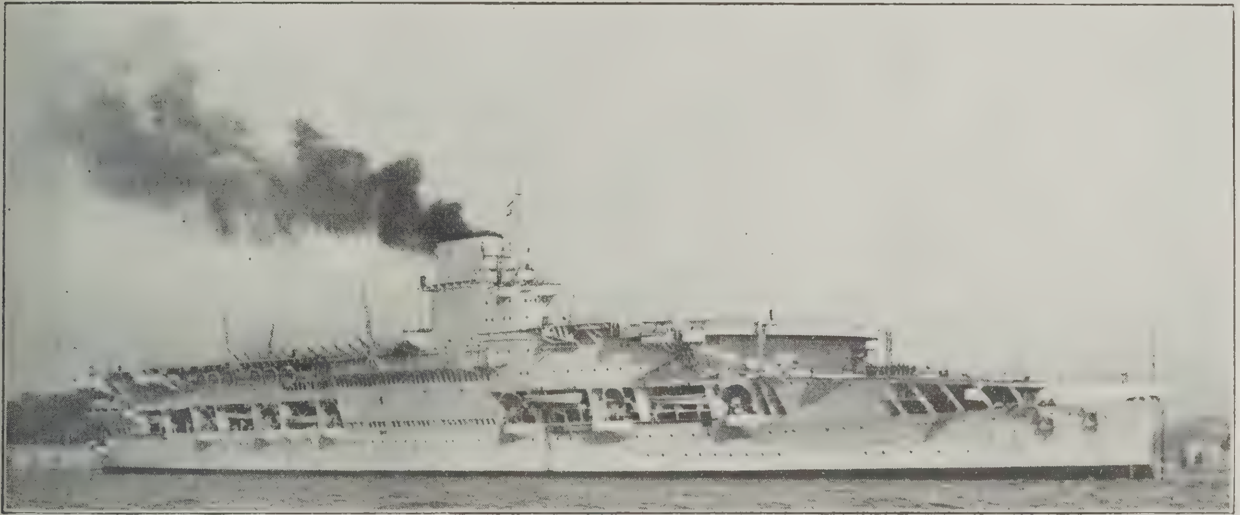

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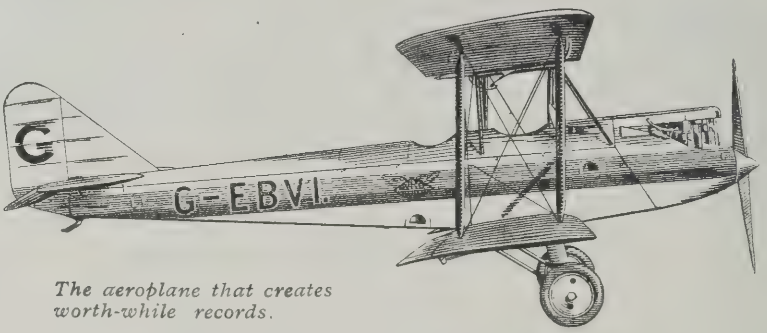

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MAY 30, 1928.

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Incorporating
Aeronautical Engineering

VOL. XXXIV
No. 22.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings. E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months, 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8$.
U.S.A., 1 Year, $8.50c.

ON THE HAMPSHIRE AIR PAGEANT.

The Hampshire Aeroplane Club is to be congratulated on having run, on Monday last, May 28, quite the best-organised Air Meeting one has yet met. The Staff-work was, as near as no matter, perfect. Every event was started well up to programme time, and the heats of the races, which were down on Sunday afternoon, were got off so well that they were all done by about 18.30 hrs., instead of at about 20.00 hrs., as the organisers expected.

Whether the Club reaped an adequate reward for its abours is quite another matter. Very obviously there were nothing like as many people or cars in the enclosures as here were at last year's meeting,—in spite of the perfect weather this time, whereas last year there were threats of ain in the morning. Somehow one has got an idea that this meeting was not so widely nor so well advertised as was the ast. And those who last year stuck in a queue of cars five miles long, without being able to go ahead or astern, naturally needed more advertising this year to induce them to come to Hamble.

Nevertheless there was quite a goodly crowd. And if the akings at the gates were less, probably the expenses also were less. So one hopes that the Club will show a profit.

As for the Club itself, it is certainly the best equipped of ny of the Flying Clubs which one has visited. The Club House is as comfortable as a good London club, the service s good, and the officials take every care for the welfare of the members, the machines are excellently up-kept, and the members seem to be a very happy family on the best of terms with heir able instructor, Mr. Swaffer, who, besides his hard ork in the air, has introduced various interesting and amusing charts and diagrams to show the members what they nd the machines and the weather are doing. Yes! The Hampshire Club is distinctly one of the best in the British sles.

Probably this accounts for the number of entries at the Meeting from other Clubs and especially from private owners. eople who have been to Hamble like going there again. nyhow there were so many entries that the heats of the hree races had to be flown on Sunday afternoon. There were competitors for the Wakefield Challenge Cup, 23 for the resident's Challenge Cup, and 23 for the Morris Challenge up

Practically the same machines and pilots were in every race. he sole exceptions were Mr. Neville Stack and the A.D.C. ircraft Co.'s Nimbus-Martinsyde, and Lady Heath and an d S.E. in the Morris Cup Race, which was the only "free r all" race of the meeting,—all the others being for light eroplanes. And unfortunately the race did not appeal to ny other owners of out-size aircraft,—which was a pity. Still the Moths, Avians and assorted odd light machines put up a very good show.

SUNDAY'S RACING.

The flying of the heats on Sunday provided good racing if singularly unexciting. Everybody flies so well in our days that there was no outstanding performance, either good or bad. And Messrs. Goodman-Crouch and Dancy have got their handicapping down to such an exact science that close finishes are the rule and not the exception.

Incidentally a close finish in an aeroplane race may not look very close. Half a dozen machines may cross the line in a dull procession and yet the last may be within six seconds of the first. But to get those machines into six seconds on a 27-mile course is no mean feat of handicapping.

The closeness of the finishes was due to the fact that the handicapping was done by human (someone said super-human) intelligence and not by scientific formulæ. In other words the handicappers allowed for what they knew of the skill of the pilots and for what they saw of the fettling-up of the machines (in the way of extra stream-lining and so forth). And they seemed to make very few mistakes.

The whole point to be decided about handicapping is whether you want close finishes to entertain the public, or whether you want merely to discover the best machine and/or pilot. In the former case human intelligence does the best handicapping. In the latter science may do so—or it may not, according to the scientific intelligence (which is not the same as human intelligence) of the high-brows to whom the job is given.

Anyhow the heats on Sunday did produce some good racing. Handicap figures and so forth being of interest only to handicappers one has given results and actual speeds only. They were as follows :—

THE WAKEFIELD CUP.

HEAT I :—JV, Mitchell (Private, Woodpigeon, Anzani); XN, Ragg (R.A.E., D.H.53, Cherub); LW, Rose (Midland Club, Moth, Cirrus); UG, Lady Heath (Avian, Cirrus II); VZ, Miss Brown (Lancashire Club, Avian, Cirrus II); UX, Butler (Private, Moth, Cirrus).—*Result*,—(1) UX, 95 m.p.hr., (2) LW, 82 m.p.hr., disqualified for missing turn, so UG competed in final heat.

HEAT II :—OO, Trench (Halton Club, Monoplane, Cherub); OT, Miss Spooner (Private, Moth, Cirrus I); OI, Swoffer (Hants Club, Moth, Cirrus I); XX, Brown (Avian, Cirrus II); XG, Broad (D.H. Moth X, Cirrus II).—*Result*,—(1) OO, 79½ m.p.hr., (2) XG, disqualified for missing turn, so OT, 80 m.p.hr., competed in final.

HEAT III :—PB, Comper (Felixstowe Club, CLA4, Cherub); SZ, Lowdell (Suffolk Club, Bluebird, Genet II); OS, Miss O'Brien (Private, Moth, Cirrus I); XY, Luxmoore (Avro; Avian, Cirrus II); TE, Bonham-Carter (Parnall, Imp, Genet II); XP, Lord Carbery (Private, Moth X, Cirrus II).—*Result*,—(1) SZ, 85½ m.p.hr., (2) TE, 86 m.p.hr.

HEAT IV :—UH, Blake (Blackburn, Bluebird, Cirrus II); MP, S

AT HAMBLE.—A Blackburn Fleet-Spotter leading a Blackburn Dart Torpedo-Dropper off the Aerodrome at the Hampshire Aeroplane Club Pageant.—("*Aeroplane*" *photograph*.)

AN OWNER PILOT.—Flt. Lt. Soden in his Moth with specially streamlined Armstrong-Siddeley Genet engine.
(" *Aeroplane* " *photograph.*)

Barbe (London Club, Moth, Cirrus I); OU, Soden (Private, Moth, Genet II); VI, Crawford (Hants Club, Avian, Cirrus II); QN, Bruce (R.A.E. Club, Avian I, Cirrus II); RN, Penrose (Westland, Widgeon, Cirrus).—*Result,*—(1) UH, disqualified, so OU classed as (1) 94½ m.p.hr., (2) QN, 100½ m.p.hr.

THE PRESIDENT'S CUP.

Heat I:—JV, Mitchell (Private, Woodpigeon, Anzani); OT, Miss Spooner (Private, Moth, Cirrus); OS, Miss O'Brien (Private, Moth, Cirrus); XY, Brown (Avro, Avian, Cirrus); TE, Bonham-Carter (Parnall, Imp, Genet).—*Result,*—(1) TE, 97½ m.p.hr., (2) XY, 93 m.p.hr.

Heat II:—OO, Trench (Halton Club, Monoplane, Cherub); SZ, Lowdell (Suffolk Club, Bluebird, Genet); OU, Soden (Private, Moth, Genet); VZ, Miss Brown (Private, Avian III, Cirrus II).—*Result,*—(1) OU, 95 m.p.hr., (2) SZ, 93 m.p.hr.

Heat III:—PB, Comper (Felixstowe, CLA 4, Cherub); OI, Swoffer (Hants Club, Moth, Cirrus I); UG, Lady Heath (Avian, Cirrus); XG, Broad (D.H. Moth X, Cirrus II); UX, Butler (D.H. Moth X, Cirrus).—*Result,*—(1) PB, 79 m.p.hr., (2) UX, 95 m.p.hr.

Heat IV:—UH, Chick (Blackburn, Bluebird, Genet); LW, Rose (Midland Club, Moth, Cirrus); XX, Luxmoore (Avro, Avian, Cirrus); RQ, Probyn (Private, Widgeon, Cirrus).—*Result,*—(1) UH, 83½ m.p.hr., (2) RQ, 99 m.p.hr.

Heat V:—XN, Ragg (R.A.E. Club, D.H.53, Cherub); MP, St. Barbe (London Club, Moth, Cirrus); VI, Crawford (Hants Club, Avian III, Cirrus II); QN, Bruce (R.A.E. Club, Avian I, Cirrus II); XP, Lord Carbery (Private, Moth X, Cirrus II).—*Result,*—(1) QN, 100 m.p.hr., (2) VI, 92 m.p.hr.

THE MORRIS CUP RACE.

Heat I:—OT, Miss Spooner (Private, Moth, Cirrus); SZ, Lowdell (Suffolk Club, Bluebird, Genet); TE, Bonham-Carter (Parnall, Imp, Genet); PA, Lady Heath (Private, SE.5a, Viper).—*Result,*—(1) SZ, 87½ m.p.hr., (2) TE, 97½ m.p.hr.

Heat II:—MF, St. Barbe (London Club, Moth, Cirrus); UG, Lady Heath (Avian, Cirrus); OU, Soden (Private, Moth, Genet); XP, Lord Carbery (Private, Moth, Cirrus); OJ, Stack (A.D.C., Martinsyde, Nimbus).—*Result,*—(1) OJ, 134½ m.p.hr., (2) OU, 95 m.p.hr.

Heat III:—OO, Trench (Halton, Monoplane, Cherub); OI, Swoffer (Hants Club, Moth, Cirrus); XY, Luxmoore (Avro, Avian, Cirrus); XG, Broad (D.H., Moth, Cirrus); RO, Penrose (Westland, Widgeon, Cirrus).—*Result,*—(1) XY, 91½ m.p.hr., (2) OI, 82 m.p.hr.

Heat IV:—PB, Comper (Felixstowe, CLA 4, Cherub); LW, Rose (Midland Club, Moth, Cirrus); VI, Crawford (Hants Club, Moth, Cirrus); RQ, Probyn (Private, Widgeon, Cirrus).—*Result,*—(1) LW, 84 m.p.hr., (2) VI, 92 m.p.hr.

Heat V:—XN, Ragg (R.A.E. Club, D.H.53, Cherub); UH, Chick (Blackburn, Bluebird, Genet); XX, Brown (Avro, Avian, Cirrus); UX, Butler (D.H., Moth, Gipsy); QN, Bruce (R.A.E. Club, Avian, Cirrus).—*Result,*—(1) XX, (2) QN.

MONDAY'S DOINGS.

The racing was rather hard to follow from the programme because several machines and pilots flew which, or who, were not in the programme at all, and certain pilots swopped over to machines which they were not booked to fly. For this reason there may be some errors in the names of machines and pilots in the heats flown on Sunday.

On the Monday the following of the racing was made easier by the excellent broadcasting of Mr. C. H. Brewer, of the B.B.C.'s Cardiff station. As a war-time night-flying pilot, who has kept closely in touch with aviation ever since, Mr. Brewer knew what he was talking about, and besides giving out his announcements intelligently and in good style, he delivered on behalf of the Club an interesting and amusing address to the crowd while waiting for the programme flying to begin.

Before the actual programme events started there was quite a good deal of assorted flying. The Handley Page Hampstead (three Jupiter engines) sent down by Imperial Airways started taking passengers early and continued to do so at opportune intervals throughout the day. As one aviator remarked, in parody of the modern journalist, " The giant air-liner wung its way through the air persistently."

Lt.-Col. G. L. P. Henderson, just back from South Africa with gold and sun-burn, also took up many passengers in a Renault Avro

Mr. F. P. Raynham on his Avian and Mr. F. G. Miles on another machine, each with a feminine passenger, provided some comic relief by " taking the family washing for an airing." Sundry stockings and other garments were strung on a line between the two machines, which proceeded to fly side by side round the aerodrome with the garments floating in the breeze. Thanks to skilful flying they landed with the clothes-line still unbroken.

One saw something of this nature done at Dayton in 1924 when three U.S. Army Air Service machines got off in formation with the inner wing-tips of the outer machines linked to the outer wing-tips of the leader with ribbons, and after evoluting for some time landed without breaking either the ribbons or themselves.

SPEED.—The Avro Avenger (Napier) giving a good imitation of a Schneider Competitor.
(" *Aeroplane* " *photograph.*)

NAPIER Achievements!

The following are a few of the recent successes achieved with Napier Engines. In all flights not the slightest mechanical trouble was experienced.

A Napier-engined Supermarine-Napier S.5 seaplane, piloted by Flight-Lieut. S. N. Webster, A.F.C., covered 100 kilometres at an average speed of 283.313 m.p.h. **A World's record.**

A Napier-engined Supermarine-Napier S.5 seaplane, piloted by Flight-Lieut. S. N. Webster, A.F.C., won the Schneider Trophy for Great Britain in September 1927. The course of 217 miles was covered at an average speed of **281.6 m.p.h.**

A Napier-engined De Havilland "Hound" Aeroplane, piloted by Capt. H. S. Broad, covered 100 kilometres carrying a load of 1000 kilograms at an average speed of 162.292 m.p.h. **A World's record.**

A Napier-engined De Havilland "Hound" Aeroplane, piloted by Capt. H. S. Broad, covered 500 kilometres carrying a load of 1000 kilograms at an average speed of 158.663 m.p.h. **Two World's records,** as this speed beat the previous World's record held by an aircraft carrying half this load.

Cairo to Cape Town and back by four Fairey-Napier aeroplanes on two separate occasions. Total engine mileage, **100,000.**

Plymouth to Singapore by four Supermarine-Napier "Southampton" flying boats. Total engine mileage, **85,000.**

The first non-stop crossing of the South Atlantic Ocean was accomplished with a Napier-engined Dornier flying boat, when Commandante Franco flew from Spain to Buenos Aires. Total engine mileage, **12,518.**

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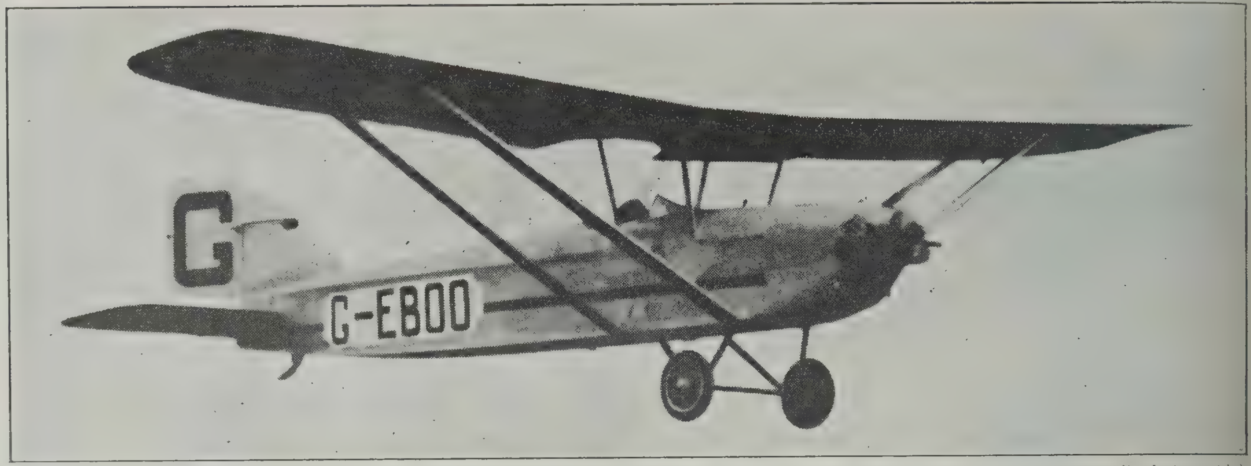


CO-OPERATIVE ENTERPRISE.—**The Halton Monoplane, flown by Flt. Lt. Le Poer-Trench.**—(*" Aeroplane " photograph.*)

A Mishap

Further interest was provided by Senor Don Juan de la Cierva, who floated around the sky with passengers in his Autogiro, much to everybody's interest, till he did one of his entertaining standstill landings from too great a height and collapsed the left side of his undercarriage, bang in the middle of the aerodrome. A criminal bystander, after seeing that the crew of the machine disembarked unhurt, remarked " That's a case of Ciervyer right,"—but he escaped in the crowd.

Thereafter the Autogiro reposed in the middle of the aerodrome looking very like a derelict windmill, and somewhat impeding the freedom of landing. One intelligent onlooker, formerly of the R.A.F., remarked that if only the Autogiro could be flown upside down it would make a splendid thing for mowing the grass on the aerodrome, which was about knee high.

Later on, when an R.A.F. formation landed independently instead of landing in formation, one commented on the fact, and the same intelligent onlooker remarked " I suppose they were scared of the Old Dutch scene in the middle of the aerodrome."

Event I.

The first event in the programme was the usual parade and fly-past. All the types which appeared, both Service and Civilian, were quite well known, and therefore it is not worth while describing them. The only arresting performance was that of the Avro Avenger.

Piloted by Flt. Lt. Luxmoore she put up a show which really excited the crowd. As she came by low down, with her Napier engine wide open somebody remarked " This reminds one of the Coppa Schneider," whereupon the wife of the secretary of a well-known Flying Club said that it sounded to her more like tearing calico,—to which another young woman replied that you would have to tear a lot of calic to make a row like that. After this exhibition of hig speed low down, and of vertical ascents, the Avenger proceeded to land pretty nearly as slowly as any of the light aeroplanes.

The Wakefield Final.

The second event was the final of the race for the Wakefiel Challenge Cup. The competitors in this were OO, the Halto Club machine piloted by Flt. Lt. Trench; SZ, the Suffolk Bluebird, piloted by Mr. Lowdell; OU, Flt. Lt. Soden's ow Moth; UG, Lady Heath's Avian; QN, the R.A.E. Club's re vised Avian, piloted by Flt. Lt. Bruce, and UX, Mr. Ala Butler's Moth.

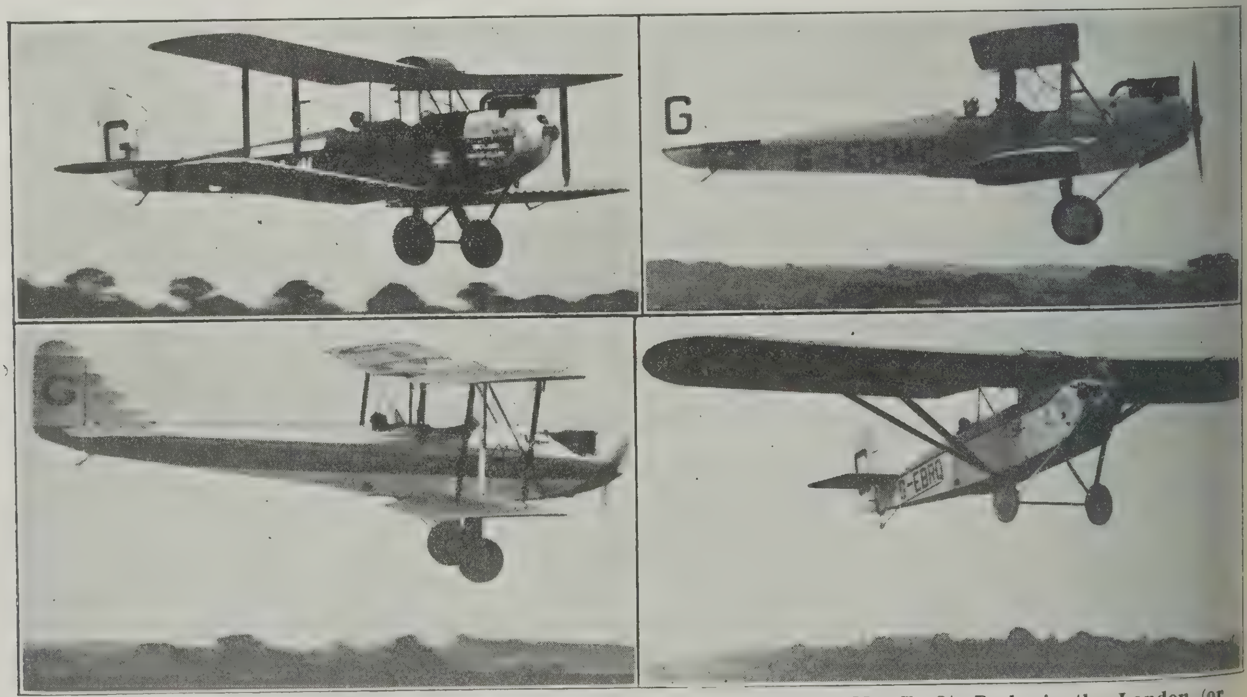
This was won by Flt. Lt. Trench on OO, with Flt. Lt Soden second on OU and Flt. Lt. Bruce third on QN. Quit a day out for the R.A.F. sporting pilots.

Everybody was glad that OO won, because the £30 priz which goes with the Wakefield Challenge Cup, and its re plica, will help the Halton Club to buy several things whic it wants. OO's actual speed was 80½ m.p.h., OU's 95½, an QN's 101½, which is very good going, considering that she i an Avian I, and therefore not of the latest vintage. O might have won, but that unfortunately she hit a telegrap wire, and so was somewhat deflected from her course at critical moment in the race.

Evolutions and Revolutions.

Event 3 was an exhibition of evolutions by a flight o four Gamecocks and a sub-formation of the Fleet Air Arm composed of two Blackburn Dart torpedo-carriers led by Blackburn fleet-reconnaissance machine. The machines evo luted all right, but were rather less exciting than th gyratory traffic in Piccadilly Circus.

Between events 3 and 4 an extra turn was provided b



COMPETITORS AT HAMBLE.—**Flt. Lt. Rose in the Midland Club's Moth; Mr. F. St. Barbe in the London (or Mustard) Club's Moth; Flt. Lt. Crawford in the Hampshire Club's Avian, and Sq. Ldr. Probyn in his private Widgeon.**—(*" Aeroplane " photographs.*)

Gothenburg!

Sweeping successes

MOTH
and CIRRUS

at the

INTERNATIONAL FLYING MEETING

at Gothenburg, May 17th—20th

The results of the International Flying Meeting at Gothenburg provide more emphatic proof of the supremacy of MOTH light aeroplanes and CIRRUS 4-cyl-in-line, air-cooled stationary light aeroplane engines. These two pioneers in their respective
ls won event after event, and the fact that the successful pilots, Mr. Carberry and Herr
eberg, are private CIRRUS-MOTH owners makes their victory over the pick of the world's
t aircraft even more decisive. The MOTH with CIRRUS engine has over $2\frac{3}{4}$ million flying miles to its credit and its many notable flights have gained for it the title—
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Streets

Mr. Rawson, who is Senor de la Cierva's test pilot, who took up a Mono-Avro G-EBNE and gave quite a pretty exhibition of upside-down flying. For a while he flew between the sun and the crowd, but fortunately he did his best flying in the right position. This consisted of flying a complete circle upside down, a thing that personally one has never seen done before, though one believes that it is now part of the regular doings of any R.A.F. pilot who considers himself to be at all in the first class.

Folding Sheds.

Event 4 was the Utility Race, in which each competitor, who had to be an *ab initio* pupil of a club, had to start up his or her own engine, fly a circuit of the course, land, fold the wings, and put the machine between two posts representing the doors of a shed. In the excitement most of the competitors landed too late, ran on, and abolished their sheds completely, one of the Moths doing some little damage to her lower port wing.

The winner was Mr. R. G. Cazalet, of the Midland Club, on his own private Westland Widgeon. The second machine was the London Club's Moth MP, piloted by Mr. Saffery.

As one of the machines knocked over the marking poles, the broadcast artist—it must have been Mr. Brewer again—announced, " Mr. Brooklyn has decided to fold his hangar and not his wings."

Aerobatics.

Event 5 was an exhibition of individual aerobatic flying on a Gamecock by Flt. Lt A. C. Collier. It was quite as pretty an exhibition of this kind of thing as one has seen. It was all the more remarkable because for something like five years Flt. Lt. Collier has occupied an office stool in the Air Ministry, and has only recently returned to regular flying, since when he has blossomed forth as quite a star-turn aerobatic flyer.

The President's Cup Race.

Event No. 6 was the final of the race for the President's Cup presented by Lord Louis Mountbatten. This brought out PB, the Felixstowe C.L.A.4, Flt. Lt. Comper; UH, the Blackburn Bluebird, Flt. Lt. Chick; SZ, the Suffolk Bluebird, Mr. Lowdell; OU, Flt. Lt. Soden's Avian; QN, the R.A.E. Club's Avian, Flt. Lt. Bruce; and TE, the Parnall Imp, Flt. Lt. Bonham-Carter.

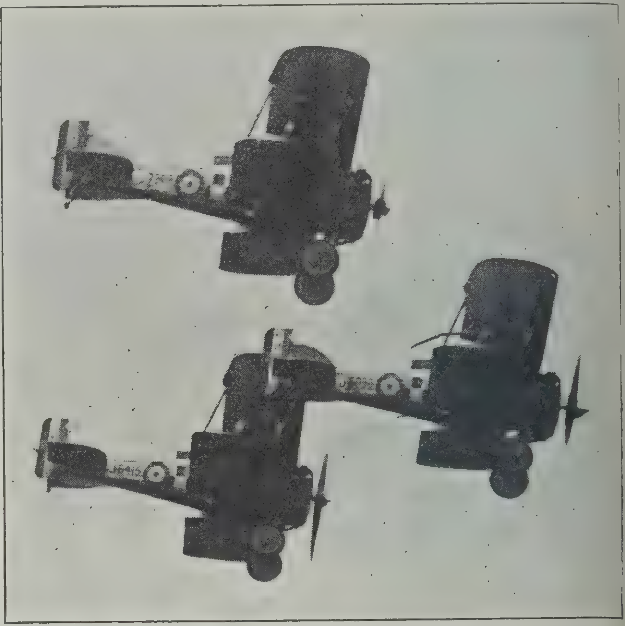
This was won by Flt. Lt. Bruce who did 102¾ m.p.h. on QN. So here again a deserving Club gets £30 towards its expenses. The second was Flt. Lt. Soden on OU at 96 m.p.h., so again a private owner benefits by the Club money. The third was Mr. Lowdell on SZ, with Flt. Lt. Bonham-Carter a good fourth.

Formation Stunting and Balloon Bursting.

Event No. 7 consisted of stunting in formation by a flight of Gloster Gamecocks, Jupiter engines, led by Flt. Lt. Collier, who was supported by Flg. Off. N. A. P. Pritchett and Flg. Off. H. C. D. Hayter. This performance was very good indeed.

The formation flew closely locked and did all its looping and turning with great precision. It was a pity they did not land in formation, but probably they were wise, for the aerodrome was somewhat encumbered by machines lining up for the next race, apart from the derelict windmill in the middle.

After this performance, Event 8, the Balloon Bursting Competition, was rather tame. Also, those who held the balloons in leash rather misjudged the strength of the wind, with the result that the evolutions happened right over at the far side of the aerodrome, whereas if they had been let off from a different position the performance would have been much more visible.



FORMATION.—The Gamecocks (Jupiter) of 43 Squadron at Hamble.—(*" Aeroplane " photograph.*)

Slots and Parachutes.

Event No. 9 was an exhibition of stalled flying by Mr. Hubert Board on a D.H. Moth with slotted wings and by Mr. Brown of A. V. Roe and Co., on a similarly slotted Avian. This was a most convincing exhibition of what can be done with slotted wings. The machines seemed to be fitted with invisible parachutes.

Event No. 10 was an air combat between an Avro Bison and a Fairey Flycatcher. As an exhibition it was rather poor. The single-seater never seemed to get into a really good shooting position in relation to the Bison. Ultimately the Bison was shot down in the flames of wing-tip flares, and two excellent dummies descended from it in parachutes, rather to the disappointment of some of the crowd who expected real live parachutists.

However, the ghoulishly-minded were gratified almost immediately afterwards when Mr. F. Tranum, who claims to be the World's record parachutist, descended from a civilian machine in a parachute made by the British Russell Lobe Parachute Company. He managed his landing to perfection by spilling the air out of his 'chute to avoid drifting into the machine-park.

Before we knew that this performance was about to happen one of a group of R.A.F. people spotted Mr. Tranum in his overalls and remarked that he must be a parachutist by the shape of his legs. This started an argument on the subject, and the general opinion seemed to be that in years to come a consistent flying member of the R.A.F. would be identi-

THE MORRIS CUP WINNER.—Mr. Neville Stack in the A.D.C. Aircraft Co.'s Nimbus-Martinsyde, in which he won the Cup presented by Mr. Morris of Cowley and Oxford.

ible by the shape of his legs, just as a Cavalryman's legs e unmistakable. The wearing of parachute-harness and the ect of the straps on the set of the legs, and the waddling lk produced by wearing the parachute when out of the chine, is evidently expected to have a permanent effect future generations of airmen.

THE MORRIS RACE.

Event No. 11 was the final for the Cup presented by Mr. orris of Cowley, Oxford, motor-car fame. In this were , the Hants Club Moth, piloted by Flt. Lt. Swoffer; LW, e Midland Club Moth, piloted by Flt. Lt. Rose; SZ, the ffolk Club Moth, piloted by Mr. Lowdell; XX, the Avro ian III, piloted by Flt. Lt. Luxmoore; XY, a similar ian, piloted by Mr. Brown; and OI, the A.D.C. Nimbus-rtinsyde, piloted by Mr. Stack. This provided by far the ost exciting race of the meeting.

Mr. Stock was giving a lap and three-quarters out of five the limit machines and something over a lap to the next arest. The handicapping was so good that the machines re actually in the same order on entering the fifth lap they were when starting, but all proportionately closer gether. At the finish, Mr. Stack won by a few seconds only d all the rest finished in a bunch. Mr. Stack's speed was 0¾ miles per hour, Mr. Lowdell's was 88 and Flt. Lt. Rose's s 84½. From this may be judged the difficulty of handicapg such a divergency of speeds over a 27-mile course, and astonishing accuracy achieved by the handicappers.

THE LAST EVENT.

Event 12, and last, was an exhibition of ground-strafing ainst a harmless mock-up of an Avro at the far side of aerodrome. This was done by the Gamecock formation, d was done quite well.

Thereafter Mr. Tranum walked on the wings of Lord rbery's Moth while in the air, and sat on the top plane ile landing—which may be entertaining, but has really thing to do with serious aviation, and has not even the cuse of being funny.

REFLECTIONS.

Altogether it was a very enjoyable meeting. Some of ose who attended all the meetings last year said that it s dull. On the other hand, several people whom one met o had never been to a flying meeting before thought that was most exciting. And others who were not absolutely iated with meetings thought that it was very good fun.

Anyhow, if the remaining meetings of the year attract as od a crowd and put up as good a show they will quite tify their existence as a means of making people air-nded.

he one thing which might be done better at these local etings is the R.A.F.'s part of the show. Either it ought be done superlatively well or it ought not to be done at

here are excellent arguments against allowing the A.F. to appear at such meetings. One may argue that cers and gentlemen ought not to turn themselves into obats for the amusement of the public. Also, one might ue that Government petrol ought not to be used, and vernment machines ought not to be risked to make a tish holiday.

lso, there is no doubt that not only by exhibition flying, in competition flying, Service officers do obtain a news-er notoriety which is not good for the tone of the vice, and in some cases is definitely detrimental to the look of the individual officer. A modest but ambitious th may quite easily be turned into a publicity-hound by ew public successes and unsought advertisement. But, course, exactly the same thing may be said of officers of of the Services who develop into football stars or plechase stars or stars in any other public competition.

n the other hand, the publicity given to the R.A.F. as ervice at these local meetings certainly might be used for good of recruiting, just as local imitations of the Royal litary Tournament at Olympia or the Torchlight Tattoo Aldershot are good for recruiting in the Army.

here is a great deal to be said on both sides. But there o excuse for sending R.A.F. detachments to a meeting allowing them to put up a poor show. One was not he Bristol Meeting, but experienced pilots, both in the vice and out of it, who were there, have said that the .F. flying was definitely bad. So far as the flying at nble was concerned, with the exception of the stunt g (especially the stunting in formation), it was merely .

o doubt the advent of the R.A.F. Display at Hendon vents the best of R.A.F. formations from being lent for vincial meetings, and therefore after the Display the .F. may have more pilots and more machines disposable such purposes.

owever that may be, the Hampshire Club are to be gratulated on having done a very good piece of work.

C. G. G.

OTE.—*The continuation of the article on the Next War, h has been crowded out of this issue by current events, be finished next week.*]

THE BANQUET TO MR. A. V. ROE.

Readers of THE AEROPLANE who wish to show their appreciation of the pioneer work done by Mr. A. V. Roe by attending the banquet in his honour at the Savoy on June 8 are advised to apply immediately for tickets (price one guinea each), to the Royal Aeronautical Society, 7, Albemarle Street, W.1.

H.R.H. The Duke of York will, unfortunately, be unable to attend the Banquet but will be present during the evening.

Among those who have signified their intention of being present, apart from Sir Charles Wakefield in the Chair and Colonel the Master of Sempill (President of the R.Ae.S., who is the chief organiser of the Banquet), are Sir Samuel Hoare (Secretary of State for Air); Air Vice-Marshal Sir John Higgins (Air Member for Supply and Research) and Lady Higgins; Capt. P. D. Acland (of Vickers Ltd., Chairman of the S.B.A.C.); Mr. J. J. Ide (of the U.S. Advisory Committee for Aeronautics); Lieut. de Vaisseau Bos (the French Air Attaché); Rear-Admiral Murray Sueter, M.P., and Mrs. Sueter; Capt. Brass, M.P.; Lt.-Cdr. Kenworthy, M.P.; Mr. l'Estrange Malone, M.P., and Mrs. Malone; and Lt.-Col. Barrett Lennard (Director of Imperial Airways Ltd.).

Among the pioneers of aviation, with whom Admiral Sueter must of course be included, are Mr. H. V. Roe (and Dr. Marie Stopes), Capt. Geoffrey de Havilland, Mr. G. Holt Thomas, Mr. Claude Grahame-White, Mr. R. A. Bruce, Mr. J. D. North (and Mrs. North), Wing Cdr. T. O'B. Hubbard, Mr. Borlase Matthews (and Mrs. Matthews), Mr. A. J. A. Wallace Barr (and Mrs. Barr), and Mr. R. M. Balston.

THE AVRO SHARE DEAL.

The following statement appeared in *The Financial News* of May 25:—

As recently foreshadowed, arrangements have now been completed whereby Sir William M. Letts has sold to the Armstrong-Siddeley Development Co. Ltd., the whole of the share capital of A. V. Roe and Co. Ltd., the well-known aeroplane manufacturers of Manchester and Hamble.

A sum of over £270,000 in cash has been paid by Sir William M. Letts to Crossley Motors Ltd. for the acquisition of their shares, which shows them a profit of more than £200,000 on their original investment in A. V. Roe and Co. Ltd.

For the last eight years Crossley Motors Ltd. have held the majority of the shares in A. V. Roe and Co. Ltd., and during that period Sir William Letts has acted as managing director of the latter company.

The fact that Crossley motors had sold their interest in A. V. Roe and Co. Ltd. was announced in *The Financial News* of May 2 last, but at the time the name of the purchaser was not known.

A. V. Roe and Co. Ltd. is a private company, registered in 1913, and until the sale now announced has been controlled by Crossley Motors. The capital is £50,000 in £1 shares, £20,000 being in 10 per Cent. Cumulative First Preference, £20,000 in 10 per Cent. Cumulative Second Preference shares, and £10,000 Ordinary, all issued and paid up.

For the year ended Oct. 31 last Crossley Motors reported a loss of £65,518, but the report stated that, in considering the accounts, it should be known that if the accumulated profits and reserves of A. V. Roe and Co. Ltd., in which the company had a large interest, had been distributed, instead of retained as working capital, the adverse balance arising from the year's trading of the company would have been eliminated.

CELEBRATING SOME AFRICAN FLIGHTS.

According to the Year Book of the Royal Aero Club the Britannia Challenge Trophy is to be awarded each year to the British aviator who in the opinion of the Committee of the Club shall have accomplished "the most meritorious performance in the air during the year." Thus whatever may be the performance which gains this award it is by definition one considered to be of outstanding merit.

To tack the presentation of the Britannia Trophy for any given year onto a ceremony celebrating some other performance, more or less as a secondary item in the programme, is therefore to write down the opinion of the Committee of the Royal Aero Club to a very low valuation and incidentally to rate the performance gaining that trophy as one of secondary importance.

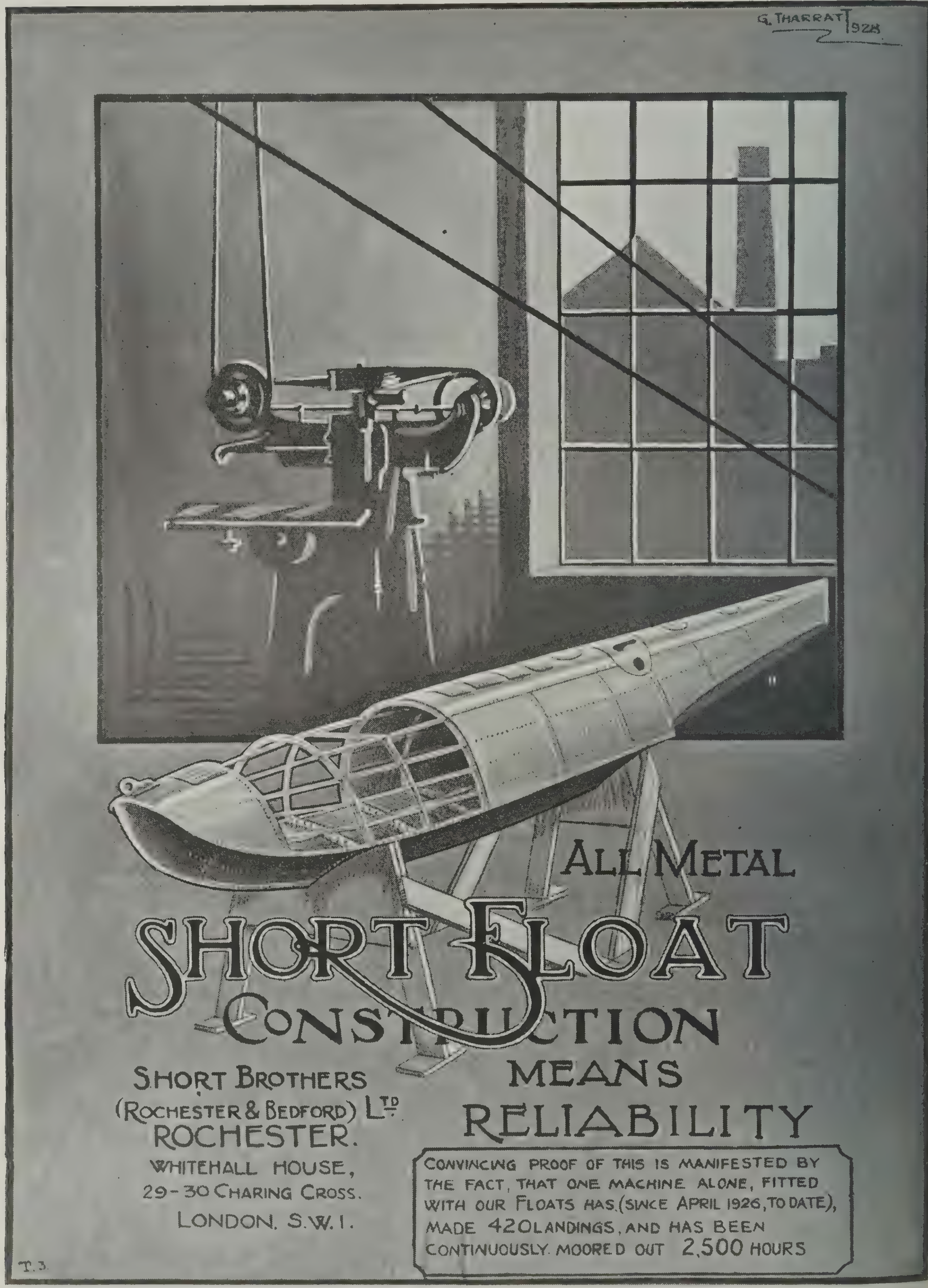
Therefore the Royal Aero Club in arranging that the Britannia Trophy should be presented to Lieut. R. R. Bentley in recognition of his flight from London to Cape Town in 1927 at a luncheon organised primarily by the Air League of the British Empire to celebrate Lady Heath's flight from Cape Town has been singularly unmindful not only of the prestige which ought to attach to the governing body of the sport of flying in this country, but it has also done less than justice to Lieut. Bentley himself.

And all this can fairly be said without casting any reflection on the merits of Lady Heath's performance.

The lunch hereinbefore in question was that given at the May Fair Hotel on May 23 by the Air League of the British Empire, supported by the Royal Aero Club, the Royal Aeronautical Society and the S.B.A.C. in honour of Lady Heath on her return from Cape Town. Of the lunch itself it is sufficient to report one lady-pilot's complaint of the uniformity of flavour of the mass-produced chicken. The proceedings that followed the meal, as usual, endured far too long.

Following the toast of H.M. The King, His Grace the Duke of

(*Continued on page 780.*)



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SUPPLEMENT TO "THE AEROPLANE"

NOTES ON AEROPLANE BRAKES.

By H. Bolas, M.B.E., B.Sc., A.M.I.C.E.*

Foreword.

The development of aeroplane brakes has only just begun -few people as yet possess any practical experience of the ubject.

The question therefore as to how the problem will even-ually be tackled is essentially a matter of personal opinion d no statements on the matter can be looked upon as thoritative.

With these reservations, the following notes are put for-ard as representing the writer's present view on what at e moment cannot be regarded as other than a controversial bject.

The Unbraked Aeroplane.

An unbraked aeroplane, after landing, is pulled up partly the retarding action of the air resistance of the whole achine, and partly by the ground friction due to the tail-id and wheels. At high ground speeds the air drag com-ises by far the greater proportion of the total resistance, t when the machine has almost come to rest the air re-stance is insignificant, retardation being now influenced gely by the drag of the tail-skid.

The distance in which such a machine will stop can be duced to a certain extent by arranging for a large wing cidence in the tail-down position, and also by so placing e main wheels and tail-skid as to obtain a heavy tail load en at rest: The effect of the first is to provide a large air sistance at high speed and of the latter to increase the ound drag at low speed. There is however a definite it to the extent to which such expedients can be used practice, since an unduly large ground incidence will in-lve the designer in objectional aerodynamic sacrifices such, instance, as an unusually large angular setting of the ngs on the fuselage, a very tall chassis, or a raked-up selage towards the rear.

On the other hand, putting the wheels well forward to rease the tail-skid load will eventually result in pro-cing a tendency to porpoise after landing and will in dition make for a machine which is awkward to manœuvre d handle on the ground.

The Aeroplane With Brakes.

he provision of brakes acting on the main wheels will stantially reduce the length of run after landing—but the stion as to how such brakes are to be applied requires cial consideration in view of the fact that the aeroplane sesses characteristics which differ from those found in ter vehicles. It is the object of these notes to examine efly the various considerations involved.

Methods of Braking.

we assume a perfect three point landing in which the raft is devoid of any vertical velocity at the instant of ching, the upward load on wheels and tail-skid will be at the beginning of the run, and will gradually increase, oming a maximum when the machine comes to rest. Any king method, therefore, which involves direct hand or foot plication from the cockpit is practically certain to result kidding the wheels at some period of the run. Further-re, such direct application if not arranged to provide per control over the load applied may easily involve over-ing unless great skill is employed in putting on the es.

is conceivable that the braking load might be regu-l by applying it through the medium of a spring, for ance, but it necessarily follows that a device which is ng enough to apply sufficient braking force at slow for-al speeds will undoubtedly cause the wheels to skid at speeds. Such a brake could only therefore be applied essfully during the later stage of the landing run.

From these considerations it seems clear that a better method of arranging the brake gear would be to make use of the reaction between ground and machine automatically to apply the brakes. With such a system, wheels adjusted so as not to skid for one particular load would never skid. To accomplish this object either the load on the chassis wheels or that on the tail-skid may be utilised to apply the brakes, the pilot being provided only with means of freeing the mechanism for taxi-ing or other purposes.

We may now consider the relative merits of chassis wheels and tail-skid as media for brake application. In the former case a grave disadvantage arises in the event of a tail-up landing because the machine may easily be overturned. The danger could of course be avoided by delaying application of the brakes until after the grounding of the tail-skid. This however implies that the pilot shall never make a mistake—a state of affairs not always fulfilled.

The method of application by which the load on the tail-skid is employed to operate the brakes has much to commend it. In this case the braking force is applied after the tail-skid has touched and when the machine is in an attitude best suited to avoid overturning. Furthermore, if danger of overturning arises—as it well might at slow speed on bad ground—the brakes are automatically released as soon as the tail-skid leaves the ground.

The system of tail-skid application would therefore seem to offer the best solution of the problem. A little consideration will show, however, that when the tail-skid is employed as the medium through which the brakes are applied there is a definite limit to the amount of retarding effort which can be attained. The reason for this is that the application of the brakes sets up a forward tilting moment on the machine tending to reduce the tail-skid load and hence in turn the braking action.

It thus happens that increase in the braking moment beyond a certain amount has no great effect in reducing landing run, and hence the full possibilities of available tyre grip cannot be realised. In practice, however, at least half the maximum possible tyre grip *can* be used, and this is probably as much as one would care to employ with any system of braking—bearing in mind the fact that some margin must always be provided to guard against overturning when pulling up on indifferent ground.

It now remains to consider the effect of tail-skid braking in a quantitative manner, after which we may proceed to study the possibilities of employing the brakes when running up the engine on the ground in order to dispense with chocks.

Tail-Skid Braking.

(1) *Equilibrium conditions.* (*See Fig.* 1.)

Let W = Weight of machine
L = Total air lift (assumed through centre of gravity)*
D = Total air drag (Ditto.)
F = Total downward force $= W - L$
R = Vertical reaction at wheels
S = Vertical reaction at tail-skid
λS = Tail-skid drag due to ground fiction
P = Wheel drag due to brakes
M = Moment about axle from brakes
η = Brake gear ratio $= P/S$

$$\mu = \frac{P + \lambda S}{F}$$

(N.B.—Drag due to axle friction has not been included above. Its value is usually relatively small compared with the tail-skid drag and account can be more readily taken of it in numerical calculations by suitably adjusting the value assumed for λ.)

(*Chief Designer, Geo. Parnall and Co., Bristol.*)

* If necessary corrections can easily be introduced in cases where the lines of action of lift and drag do not pass through or near the centre of gravity.

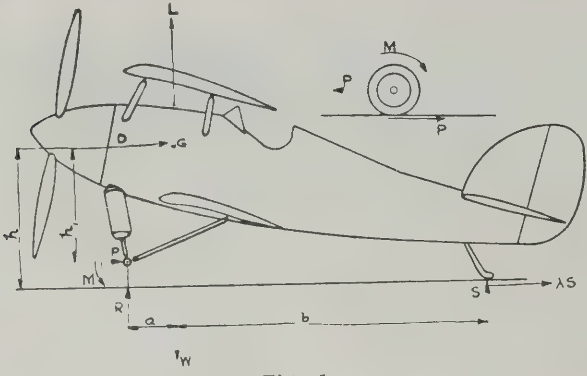

Fig. 1.

Then, referring to Fig. 1, we have $F=W-L=R+S$ (1) and taking moments about G:—

$$Ra-Ph_1-M-Sb-\lambda Sh=0 \qquad (2)$$

Also, neglecting wheel inertia, $M=Pr$. (3)

Whence we find

$$R=\frac{F(\lambda h+b)+Ph}{a+\lambda h+b}=\frac{F(\lambda h+b)+Ph}{l} \qquad (4)$$

$$\text{and } S=\frac{Fa-Ph}{a+\lambda h+b}=\frac{Fa-Ph}{l} \qquad (5)$$

where $A+\lambda h+b$ is written as l.

Now since the braking load P is produced by the tail-skid load S and is therefore directly proportional to it, we may write:—

$$P=\eta S. \qquad (6)$$

Inserting this in equations (4), and (5), we have finally:—

$$\frac{P}{F}=\frac{a\eta}{l+\eta h} \qquad (7)$$

$$\frac{S}{F}=\frac{a}{l+\eta h} \qquad (8)$$

$$\frac{R}{F}=1-\frac{S}{F} \qquad (9)$$

$$\frac{P+\lambda S}{F}=\frac{a(\eta+\lambda)}{l+\eta h}=\mu \qquad (10)$$

In equation (10) $\frac{P+\lambda S}{F}$ is the ratio of total "Ground-braking force" to total down load on the ground.

(2) LANDING RUN.

It is sufficient for our purpose to assume the landing made in a calm on flat horizontal ground.

Let V = Velocity of machine at any instant
Ds = Total air drag at moment of landing (i.e., say total drag at stalling angle of machine, engine off)
Vs = Velocity of machine at moment of landing (i.e., say stalling speed of machine, engine off)
x = Distance run from point of landing
t = Time from instant of landing
X = Length of run.

$$\text{Then } L=\frac{WV^2}{Vs^2} \qquad (11)$$

$$D=\frac{DsV^2}{Vs^2} \qquad (12)$$

$$\text{And total drag}=Ds\frac{V^2}{Vs^2}+(P+\lambda S)$$

Which by using equations (1), (10), and (11), may be re-written: $\text{Total drag}=\mu W-(\mu W-Ds)\frac{V^2}{Vs^2}$ (13)

The equation of motion is therefore:—

$$\frac{W}{g}\frac{dV}{dt}=-\mu W+(\mu W-Ds)\frac{V^2}{Vs^2} \qquad (14)$$

Writing $\frac{dV}{dt}$ as $\frac{1}{2}\frac{d(V^2)}{dx}$ the solution is

$$\frac{V^2}{Vs^2}=\frac{1}{\mu W-Ds}\left(\mu W-Ds\,e^{\frac{2g(\mu W-Ds)x}{WVs^2}}\right) \qquad (15)$$

And the total length of run before coming to rest

$$X=\frac{WVs^2}{2g(\mu W-Ds)}\log_e\frac{\mu W}{Ds} \qquad (16)$$

Equations (15) and (16) may be used to calculate V and X except in the special case where $\mu W=Ds$. In this instance the total drag is constant and equal to μW. (See equati (13).) The deceleration is therefore also constant and equ to μg. In which case equations (15), and (16), becom

$$\frac{V^2}{Vs^2}=1-\frac{2g\mu S}{Vs^2}$$

$$X=\frac{Vs^2}{2\mu g}$$

LIMITING TYRE GRIP.

In order to determine the limiting (i.e., skidding) fricti coefficient between tyre and ground, the following experim was carried out on a typical piece of aerodrome. Two Paln wheels size 575 × 60 mm. were attached to a beam in su a manner as to be prevented from rotating. (See Fig.

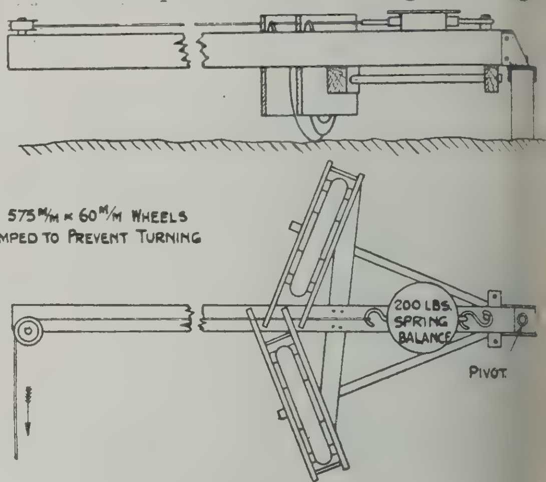

Fig. 2.

The beam was arranged to hinge freely about its cent pivot, the wheels being disposed so that their spindles produced would intersect the axis of rotation of the bea A platform attached to the beam allowed of the wheels bei loaded up as required. The beam was rotated slowly, t torque requisite for the motion being registered on a spri balance attached to the towing rope. The data thus obtain enabled curves to be plotted showing the ratio of drag fo to weight on the wheel. These are shown in figure 3.

Owing to bumps in the ground the readings of the balan showed maximum and minimum values which are given curves A. and B.

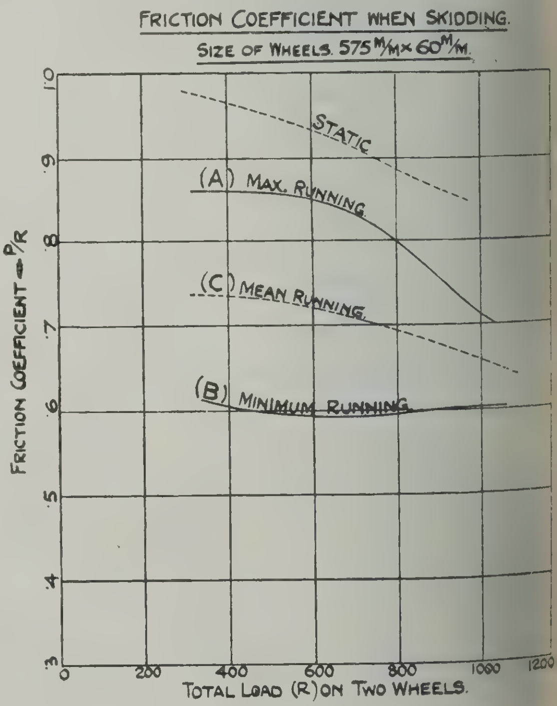

Fig. 3.

As the load on the wheels was increased the bumps beca more and more flattened and hence the maximum and mi mum readings tended to converge towards a mean val The dotted curve C. gives the mean of the maximum minimum readings.

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It will be seen in this particular experiment that the "skidding" friction coefficient appears to tend towards a limiting value of approximately 0.6. To afford complete data the experiments should of course be extended to include a series of wheels of different sizes and measurements taken in varying conditions of aerodrome surface.

Friction Coefficient of Tail-Skid.

Tests carried out on a Parnall Pixie by dragging it along the ground with a spring balance inserted in the towing rope suggest that the tail-skid friction coefficient at low speeds may be assumed to be of the order of .55. In the numerical calculations a value of .6 has been adopted to include the effect of axle friction.

A Numerical Case.

It is of interest to take an actual case and to observe the effect of variation of η (or gear ratio between braking load and tail-skid load) upon the landing run. The following values have been assumed:

$W=3{,}450$ lbs.; $a=2.71$ ft., $h=6.33$ ft., $b=13.33$ ft., and hence $l=19.84$; $Ds=578$ lbs.; $Vs=55$ m.p.h. $=81$ ft./sec.; $\lambda=.6$.

Whence we have (equations (7) and (8)).

$$\frac{P}{F}=\frac{\eta}{7{\cdot}33+2{\cdot}34\eta}$$

$$\frac{S}{F}=\frac{1}{7{\cdot}33+2{\cdot}34\eta}$$

The results are given in table I below, and shown plotted in Fig. 4.

TABLE I.

η	$\frac{P}{F}$	$\frac{S}{F}$	$=\frac{\mu P+\lambda S}{F}$	$\frac{P}{R}$	X (yards)
0	0	.1365	.082		285
.75	.0826	.11	.1486		218
1.5	.1384	.092	.1936	.1524	189
2.0	.1665	.0826	.2160	.1815	178
3.0	.209	.0696	.2507	.224	165
4.0	.24	.06	.276	.255	157
5.0	.2626	.0526	.2942	.277	152
6.0	.281	.0468	.3091	.295	148
7.0	.295	.0422	.3203	.308	145
8.0	.307	.0384	.330	.319	143
10.0	.325	.0325	.3445	.336	139

Reference to the curve, Fig. 4, shows that a large percentage of the possible reduction of landing run can be achieved by adopting a value of η of about 4, the further saving in run obtained by increasing η above this value bein fairly small. The reason for this of course is that increas in the applied braking moment tends to reduce the tail-ski load—this in turn resulting in reduced braking effect.

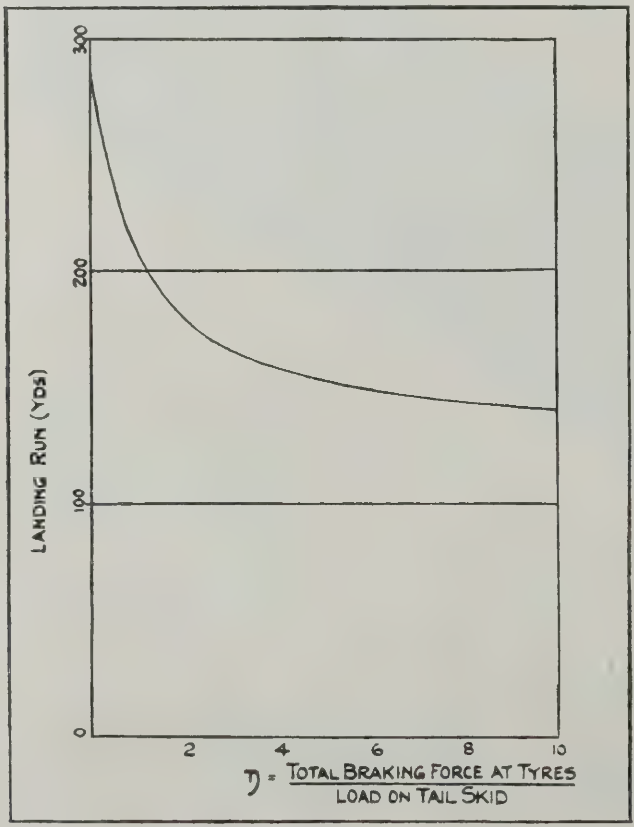

Fig. 4.

Again, much greater values of η than 4 are not easy t attain in practice owing to the high gear ratio required b tween tail-skid and brake, and the consequently large trav demanded at the tail-skid end for a given relief of th brakes.

Table I shows that if η is made equal to 4 the ratio wheel drag to wheel load is .255 or about half that avai able before skidding takes place. (See Fig. 3.)

It is doubtful, however, whether a much greater value coul be safely permitted with any braking system owing the danger of overturning in the case of hitting bumps, et In any case at low speeds a value of P/R of .5 could probably overturn any machine having its wheels in the usu position relative to the centre of gravity—even though th aerodrome be of billiard-table variety.

Braking and Tail-Skid Loads During the Run.

For any chosen figure for η we can compute the brakin and tail-skid loads at any time during the landing run, b employing the results of table I and using equation (15 Thus, adopting the numerical data already given and a suming a value of η of 4.0 the calculated values of V, P, an S, are shown in Table II below, and plotted in Fig. 5.

TABLE II. (η = 4.0)

x ft.	V ft./Sec.	L lbs.	F lbs.	P lbs	S lbs.
0	81	3,450	0	0	0
100	73.9	2,850	600	144	36
200	64.8	2,200	1,250	300	75
300	53	1,465	1,985	476	119
400	35.2	645	2,805	673	168
450	20	209	3,241	778	194
470	Just Moving.	0	3,450	828	207

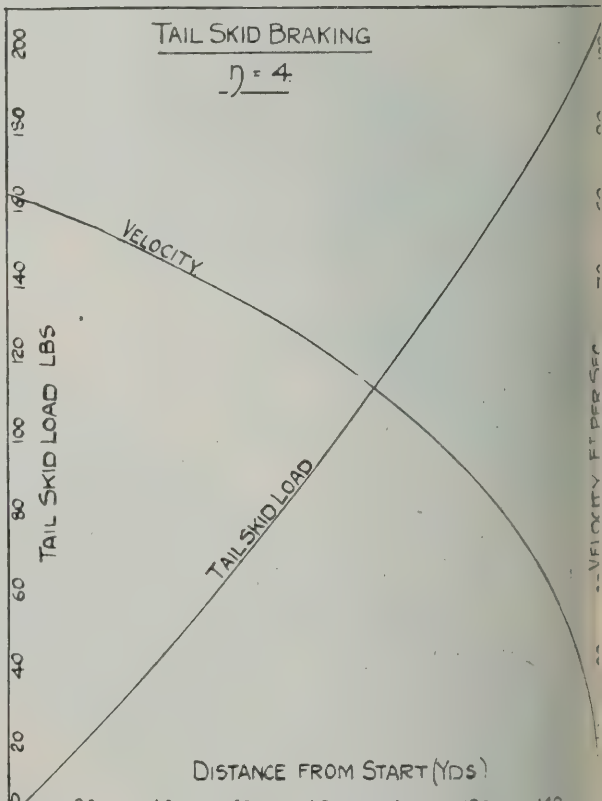

Fig. 5.

Use of Brakes as Chocks.

The brakes may be employed, instead of chocks, when ru ning up the engine on the ground provided that by use the elevators sufficient down load can be maintained on th tail-plane to prevent the machine from overturning, a also that the braking force and tail-skid friction combin are sufficient to withstand the forward thrust of the ai screw.

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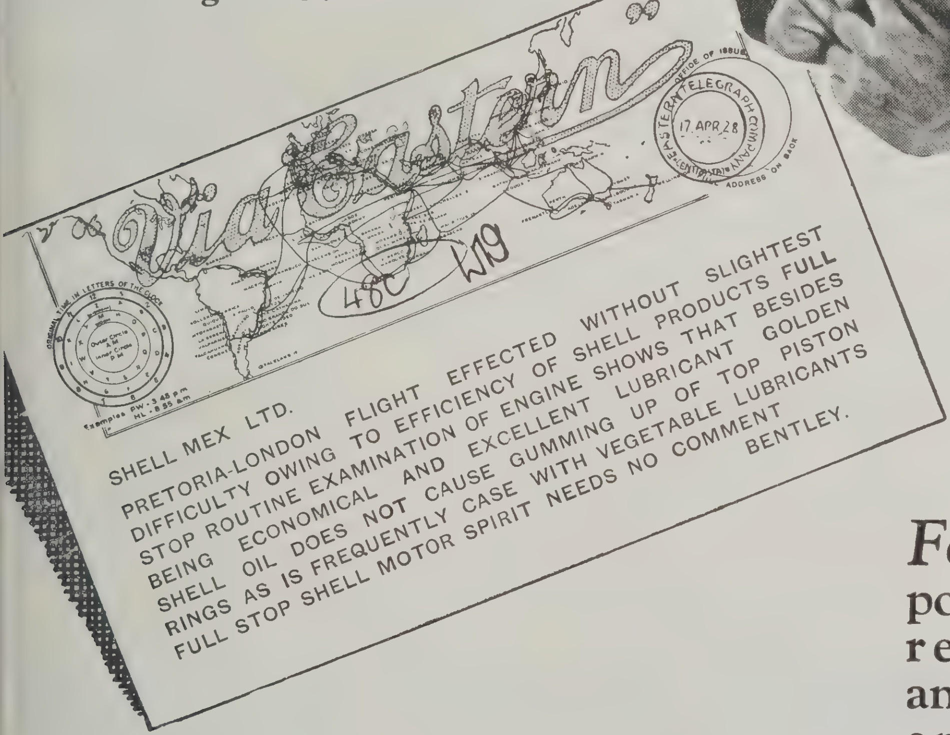
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In addition to symbols hitherto given, let

T = static propeller thrust (here assumed to pass through centre of gravity of machine, and to act in the direction of the propeller shaft)

Q = down load on tail.

The value of Q is here supposed to be that obtaining when the wheels are just on the point of rolling, i.e., it is the minimum down load required to hold the machine. We shall neglect lifting effects on the machine due to slipstream. We now have, referring to Fig. 6,

$$P+\lambda S=T\cos.\theta \qquad (19)$$

$$W+Q=R+S+T\sin.\theta \qquad (20)$$

And taking moments about G.

$$Ra+Qb-Sb-Ph-\lambda Sh=0 \qquad (21)$$

Also as before $P=\eta S$. (22)

The solution of these equations gives

$$R=\frac{T(h\cos.\theta-b\sin.\theta)+Wb}{a+b} \qquad (23)$$

$$Q=\frac{T(h\cos.\theta+a\sin.\theta)-Wa}{a+b}+\frac{T\cos.\theta}{\eta+\lambda} \qquad (24)$$

$$S=\frac{T\cos.\theta}{\eta+\lambda} \qquad (25)$$

In the numerical example before taken we have :—

$T=1{,}500$ lbs; $\theta=15$ degrees; $W=3{,}450$ lbs.; $a=2.71$ ft.; $h=6.33$ ft.; $b=13.33$ ft.; $\lambda=0.6$.

And we can tabulate values of Q, etc., for various values of thus :—

TABLE III.

η	S	Q	$P=\eta S$	R	$\frac{P}{R}$
3	403	461	1,210	3,120	.388
4	315	373	1,260	3,120	.404
5	259	317	1,295	3,120	.416

It will be seen that for $\eta=4$ a minimum down load of 373 lbs. must be produced upon the tail plane by holding up the elevator. In the case in point this would involve an elevator angle of about 12 degrees, so that if we assume a total available elevator angle of 30 degrees, use of the brakes in place of chocks would present no difficulty. The corresponding P/R value for the wheels is .404 which is less than the skidding value shown in Fig. III. Hence if we adopt the curves of Fig. III as being applicable to the ground conditions obtaining, the tyre grip will be sufficient to hold the machine.

PRACTICAL CONSIDERATIONS.

The load may be transferred from tail-skid to brake by purely mechanical means, or by employing a suitable hydraulic arrangement, the latter being probably preferable. In any case considerable gearing up of load from the tail-skid to brake surface will be found necessary.

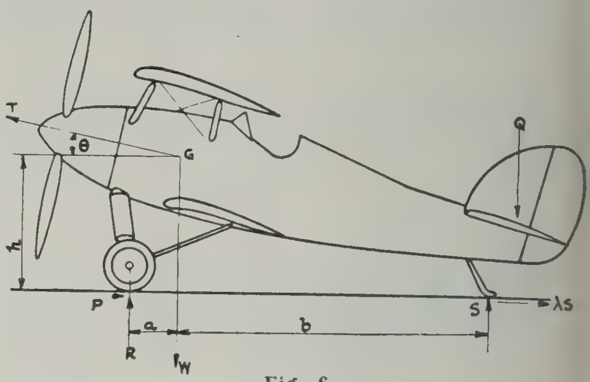


Fig. 6.

Thus suppose the upward tail-skid load at the end of the run just before stopping to be represented by S_0 and that $\eta=4$. Then the total tangential load required at the periphery of the wheels $=4S_0$, or if there are two wheels, $2S_0$, per wheel.

Assuming that the mean radius at which the braking force is applied is ⅓ the radius of the wheel, we need a tangential force at each brake of $6S_0$ and if the obtainable friction coefficient of the brake is .3, a single surface brake would require a normal pressure of $20S_0$ representing a load gear ratio of 40 : 1.

It thus becomes clear that to obtain a reasonable brake separation without excessive tail-skid travel the chosen value of η must be as small as is consistent with reasonable pull-up.

GENERAL CONCLUSIONS.

The result of the investigations may be briefly summarised as follows :—

(1) That of the several methods of brake application available, that in which the tail-skid load is employed to apply braking force to the wheels is probably the safest and most fool-proof.

(2) The brake gear ratio (defined as the ratio of total braking force at the periphery of the tyres to the upward load at the tail-skid) should probably not greatly exceed 4 in a normal case. A large value of the factor is not easy to obtain owing to the excessive travel then required at the tail-skid end for a reasonable amount of separation of the brake surfaces.

In any case the comparatively small rate of reduction in landing run at the higher values of η does not warrant such selection.

(3) Wheel skidding is improbable with this form of brake.

(4) The brakes may be used in place of chocks provided that the brake gear ratio η can be suitably chosen in relation to the maximum tail down load attainable by the use of the elevators.

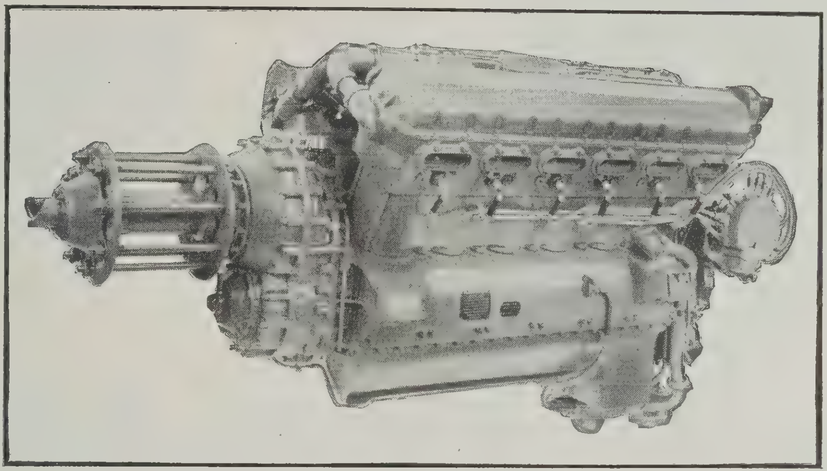
THE FIRST FRENCH MACHINE WITH SLOTS.

The first aeroplane built in France with Handley Page slots has just been tested at Villacoublay. This machine, built by the Ateliers d'Aviation François Villiers, who have acquired the French rights in the Handley Page patents, is a two-seat night-fighter known as the Villiers Type XXIV.

The machine in question is a biplane with a lower wing o much smaller chord and somewhat less span than the upper wing, very similar in general design to the two seat night-fighter, type 5C-2, built by this firm in 1927.

The top wing alone is fitted with slots, which are of the type which extend over the whole span, are mechanically

THE SLOTTED-WING IN FRANCE.—The Villiers XXIV two-seat night-fighter (450 h.p. Lorraine-Dietrich engine) fitted Handley Page slots and flaps.—(" L'Aéronautique " photograph.)



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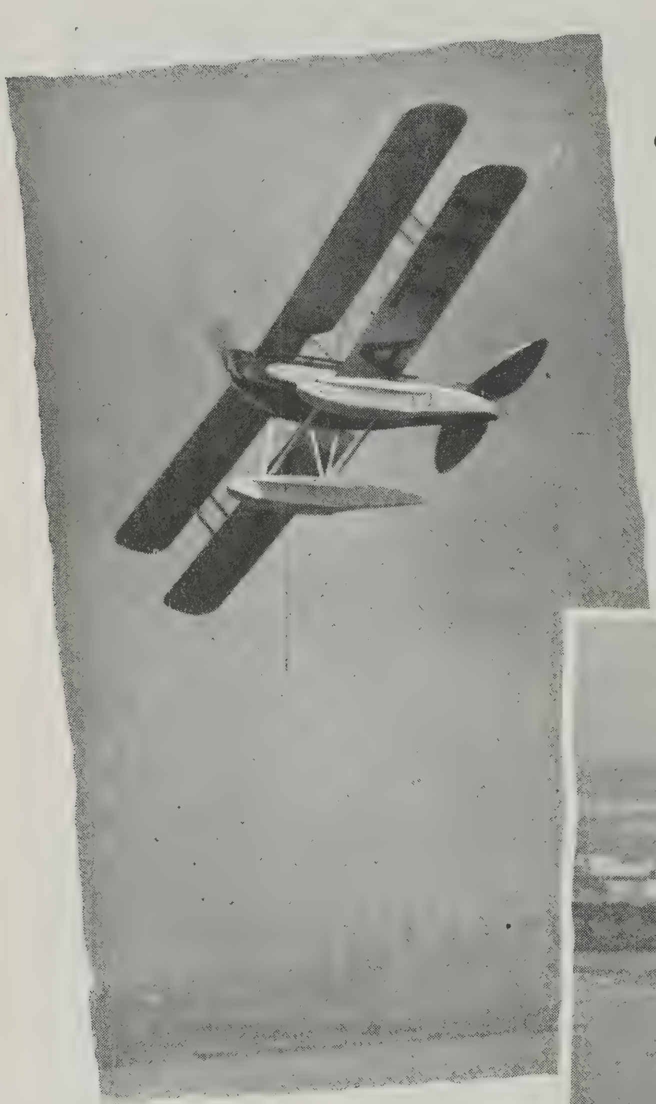

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controlled, and work in co-ordination with trailing-edge flaps. The wing section used is the R.A.F.31, which was also employed on the Handley Page Hamlet monoplane, and in fact the details of slots and operating gear are very similar to those of this machine.

The trailing-edge flaps—which extend from wing-tip to the cut-out over the pilot's seat—are divided into two sections on each side. The outer sections alone are connected to the control lever and act as ailerons. These ailerons are interconnected with the section of auxiliary aerofoil in front of them, so that the pulling down of the aileron opens the slot ahead of it.

The main purpose in fitting slots to this type of machine has been the reduction of landing and taking-off speeds for night-flying purposes. The newer type of automatic slot has not been used, but it is said that there is no difficulty in making at least the section of leading-edge slot ahead of the ailerons automatic.

Prolonged tests, made by the well-known test pilot, M. Descamps, are said to have proved exceedingly satisfactory. With a wing-loading of 52.8 kg. per sq. m. (10.75 lbs./sq. ft.) the minimum flying speed with slots closed is said to be 101 km.h. (63 m.p.h.). With open slots the minimum speed falls to 70 km.h. (44 m.p.h.).

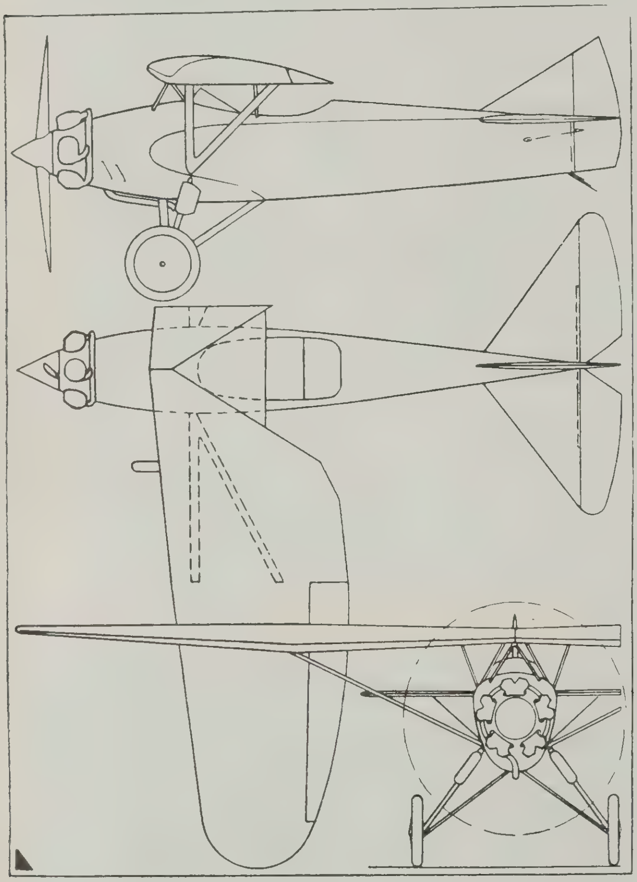
A specification and outline drawing of the machine will be found in the New Aeroplanes Section of this issue.

NEW AEROPLANES.

The "American Moth."

MADE BY THE VULCAN AIRCRAFT CO., Portsmouth, Ohio, to designs by Mr. John Pavlecka. Two-seater light aeroplane.

WINGS.—Strut-braced parasol monoplane. Wing in three sections, centre section triangular (apex forward) in plan and of reduced chord. Outer sections of maximum chord and thickness about half-way along half-span at junction of struts and heavily rounded off towards tips. Centre section carried on a pyramid of struts forward and W struts aft. Main wing struts arranged as inverted Vees attached to fuselage below front spar. Wing and aileron spars of spruce, with duralumin ribs. Leading edge of wings and aileron covered with duralumin sheet. Ailerons are of Bristol "Frise" type, inset from wing tip.



FUSELAGE.—Welded steel tube framing with three longerons, one at bottom. Two intermediate longerons near bottom over cockpit section. Rigidly-braced throughout. Top and bottom fairings of aluminium sheet, sides covered with fabric. Faired section of body is circular at engine bulkhead, pentagonal at cockpits and triangular at stern.

UNDERCARRIAGE.—Split-axle, Vee type. Front legs of Vees of round tubes telescoping and supported by rubber-cord shock absorbers. Rear leg of streamline section. Wheel track 6 ft. (1.83 m.). Laminated spring tail-skid. ...

TAIL UNIT.—Of normal type.

POWER PLANT.—Any radial air-cooled engine of 60/80 h.p. may be fitted. A six-cylinder Anzani 60/80 h.p. normally fitted. Main fuel tank (13 U.S. = 10.8 Imp. galls. = 49 litres) in centre section, auxiliary tank (8 U.S. = 6.6 Imp. galls. = 30 litres) in fuselage. Oil tank (3 U.S. = 2.5 Imp. galls. = 11 litres) on fireproof bulkhead behind engine.

ACCOMMODATION.—Two open cockpits in tandem, front one below and rear one behind cut down centre section. Dual control standard.

DIMENSIONS.—Span 30 ft. 9 in. (9.4 m.), Length 18 ft. 0 in. (5.5 m.), Height 7 ft. 3 in. (2.2 m.), Wing area 135 sq. ft. (12.5 sq. m.).

WEIGHTS AND LOADINGS.—Weight empty 650 lbs. (296 kg.), Fully loaded 1,100 lbs. (500 kg.), Wing loading 8.15 lbs./sq. ft. (40 kg./sq. m.), Power loading 13 lbs./h.p. (6.25 kg./h.p.) (80 h.p.).

PERFORMANCE.—(80 h.p.) Maximum speed 115 m.p.h. (185 km.h.), Landing speed 43 m.p.h. (69 km.h.), Climb from ground 700 ft. (213 m.) per min., Range 420 miles (675 km.).

The Bartel M.4.

MADE BY "SAMOLOT" LAWICA, POLAND, to designs of R. Bartel. Two-seater training machine.

WINGS.—Single bay biplane with heavy stagger and upper wing of equal chord but less span than lower. There is no upper centre section and upper and lower wing units are interchangeable. Interplane struts are of N type. Ailerons on both upper and lower wings Timber framed wings, fabric covered.

FUSELAGE.—Rectangular section, timber framed.

TAIL UNIT.—Of normal type, steel tube frames, fabric covered.

UNDERCARRIAGE.—Cross-axle Vee type. Rear leg of each Vee has telescopic shock absorbers.

POWER PLANT.—85 h.p. Walter air-cooled radial. (A number of alternative engines, including the 80 h.p. Siemens Halske, 80 h.p. Le Rhône, and the Cirrus Mk. II, may be fitted.)

ACCOMMODATION.—Two open cockpits in tandem, one below leading edge of upper wing and one further aft. Dual control.

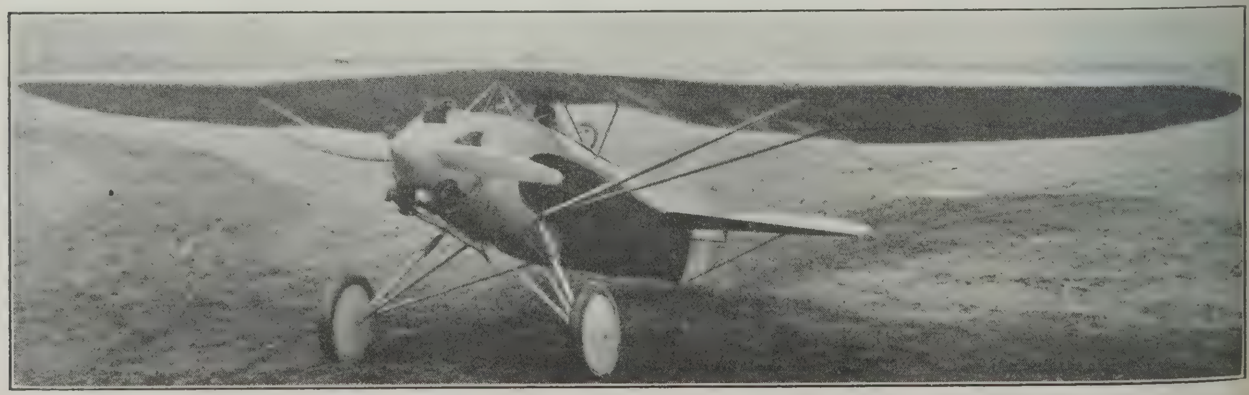
DIMENSIONS.—Span 10.175 m. (33 ft. 5 in.), Length 7.22 m. (23 ft. 8 in.), Height 2.93 m. (9 ft. 8 in.), Wing area 25 sq. m. (268 sq. ft.).

WEIGHTS AND LOADINGS.—Weight empty 520 kg. (1,144 lbs.), Weight loaded 770 kg. (1,694 lbs.), Wing loading 30.8 kg./sq. m. (6.3 lbs./sq. ft.), Power loading 9.1 kg./h.p. (20 lbs./h.p.).

PERFORMANCE.—Maximum speed 140 km.h. (87 m.p.h.), minimum speed 60 km.h. (38 m.p.h.), Climb to 1,000 m. (3,280 ft.) 7 mins. Ceiling 4,000 m. (13,120 ft.), Endurance 3 hours.—(*Lot-Polski, No.* 5, 1928.)

The Morane-Saulnier Type 221.

MADE BY AEROPLANES MORANE-SAULNIER, 3, Rue Volta, Puteaux (Seine), France. Light single-seat fighter to French "Jockey" class specification.



The American Moth light two-seater with Anzani engine.

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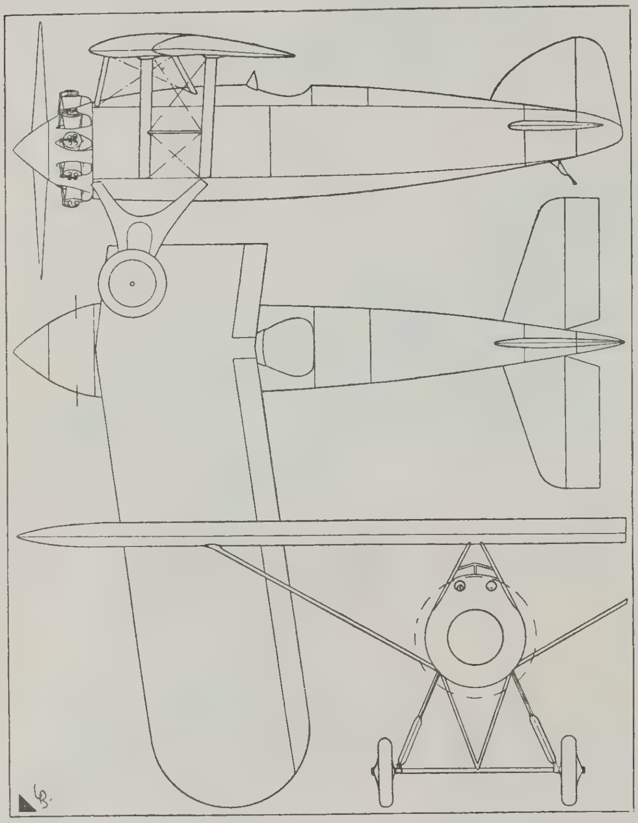
Wings.—Braced parasol monoplane. Marked sweep-back from centre to tips. Wings in two sections, joining on centre line and supported there on inverted V struts. Two inclined struts per side run out to a little over half-way to tips. Ailerons of very narrow chord extend inwards nearly to centre line. These may be used as flaps to reduce landing speed. Duralumin spars, wooden ribs.

Fuselage.—Wooden frame wire-braced, faired to nearly circular cross section. Covered in sheet metal to pilot's seat, thereafter with fabric.

Tail.—Of normal type, with unbalanced control surfaces. Metal framing throughout.

Undercarriage.—Cross-axle Vee type. The two Vees are each a built-up unit of duralumin and shock absorbers are encased within the covering of the Vees. The axle is hinged at its centre and the hinge supported by struts from the fuselage.

Power Plant.—One Gnôme-Rhône Jupiter engine (ungeared high compression type, 600 h.p.). Fuel tank (265 litres = 56 galls.) in fuselage ahead of pilot. The tank may be dropped in case of fire. Oil tank (31 litres = 79 galls.) under top cowling immediately behind fireproof bulkhead. Fuel fed to carburettor by A.M. petrol pumps. Fire extinguisher and a high temperature alarm fitted in front of fire bulkhead.



Accommodation.—Pilot's cockpit behind trailing edge of wing. Sloping line of cowling ahead gives excellent view ahead. Two Vickers guns (synchronised) are fitted The cockpit provides for a seat type parachute.

Dimensions.—9.80 m. (32 ft. 2 in.), Length 6.50 m. (21 ft. 4 in.), Height 2.985 m. (9 ft. 10 in.), Wing area 16 sq. m. (172 sq. ft.).

Weights and Loadings.—Weight empty 905 kg. (1,991 lbs.), Fuel 190 kg. (418 lbs.), Military load (including pilot) 105 kg. (231 lbs.), Fully loaded 1,200 kg. (2,640 lbs.), Wing loading 75 kg./sq. m. (15.3 lbs./sq. ft.), Power loading 2 kg./h.p. (4.4 lbs./h.p.).

Performance.—Maximum speed (sea level) 268 km.h. (166 m.p.h.), at 4,000 m. (13,120 ft.) 265 km.h. (164 m.p.h.), Climb to 5,000 m. (16,400 ft.) 8 mins. 45 secs., Service ceiling 8,000 m. (26,240 ft.).

The Villiers Type XXIV.

Made by Ateliers d'Aviation Francois Villiers, 12, Rue de Villejust, Paris.

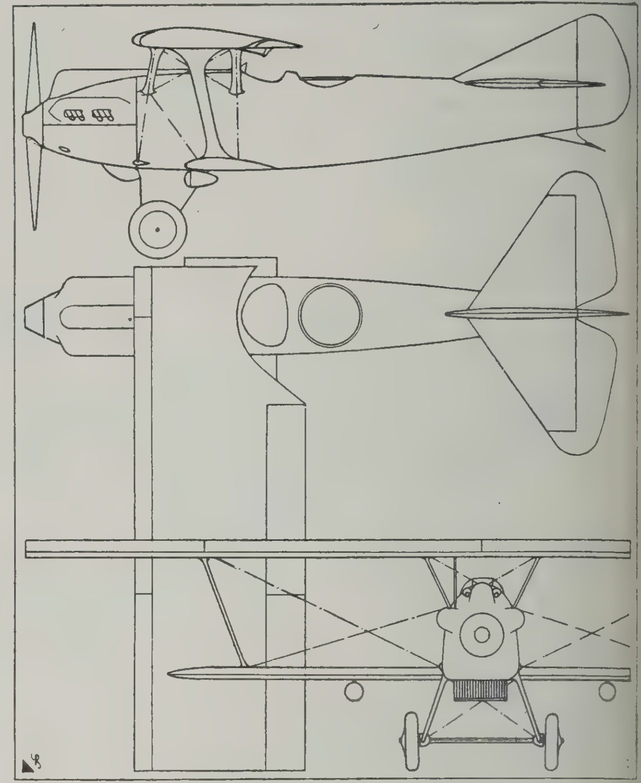
Wings.—Biplane with small lower wing. One I strut raking outwards and upwards per side. Both wings rectangular. Top wing built on spruce box-spars, lower wing on duralumin spars. Ribs of spruce. Upper wing of R.A.F.31 section fitted with Handley Page slots. (See preceding description, page 772.)

Fuselage.—Rectangular section with rounded corners. Built on laminated formers, with six longitudinal and three ply-covered.

Tail.—Triangular tail plane, with horn-balanced elevators. Triangular fin with unbalanced rudder. Fin and tail plane covered with veneer. Elevators and rudder fabric covered.

Undercarriage.—Cross-axle type. Undercarriage legs are in one unit on each side built up of laminated wood. Tail skid laminated steel spring type.

Power Plant.—One Lorraine-Dietrich "W" type of 450 h.p., ungeared, carried on detachable duralumin engine-mounting. Mounting may be interchanged with mounting for other engines if desired. Retractable Lamblin radiators below the fuselage.



Accommodation.—Two open cockpits in tandem. The pilot's seat is below the trailing-edge of the upper wing. Behind, but close up, is the gunner's seat with Scarff ring. A removable control is fitted in the rear seat.

Dimensions.—Span, top, 13 m. (42 ft. 8 in.), Bottom, 9 m. (29 ft. 6 in.), Length 8.75 m. (38 ft. 7 in.), Height 3.3 m. (10 ft. 10 in.), Wing area 42 sq. m. (453 sq. ft.).

Weights and Loadings.—Weight empty 1,469 kg. (3,235 lbs.), Fuel and oil 300 kg. (660 lbs.), Crew and military load 450 kg. (990 lbs.), Weight loaded 2,219 kg. (4,885 lbs.), Wing loading 52.8 kg./sq. m. (10.75 lbs./sq. ft.), Power loading 4.97 kg./h.p. (10.9 lbs./h.p.).

Performance.—Max. speed at ground 212 km.h. (131 m.p.h.), Max speed at 5,000 m. (16,400 ft.) 200 km.h. (124 m.p.h.), Minimum speed, slots closed, 101 km h. (63 m.p.h.), slots open, 70 km h. (44 m.p.h.), Climb to 6,000 m. (19,680 ft.) 50 mins, Endurance 3 hours.

The Wibault Trombe.

Made by Avions Michel Wibault, Avenue des Molineaux, Billancourt (Seine), France. Light single-seat fighter to French "Jockey" class specification.

Wings.—Braced parasol monoplane. Wings in two sections joined on centre line of machine. Supported by a pair of vertical N struts from top of fuselage and by inclined struts from bottom of fuselage to about half-way along semi-span, with intermediate stabilising struts. Ailerons of very narrow chord run from wing-tips to cut-out over pilot's seat. Wing structure entirely of duralumin, including covering.

Fuselage.—Rectangular section with domed top surface. Top line of fuselage rakes down markedly from pilot's cockpit to nose. Framework is a triangulated structure of extruded duralumin sections, covered with sheet duralumin.

Tail Unit.—Conventional form. No control surfaces balanced. Framed and covered in duralumin.

Undercarriage.—Split-axle, Vee type, with Vickers type oleo-pneumatic shock absorber in front leg of Vee. Axles hinged to a short inverted V cabane below fuselage

Power Plant.—One Hispano-Suiza V type engine 400 h.p. (Type 13 Cl.) or 500 h.p. (Type 16 Cl.).

Accommodation.—Cockpit below trailing edge which is cut-back slightly at centre. Pilot's eye-level in plane of the wing chord. Arranged for use of seat type parachute and fitted with twin synchronised Vickers guns and accommodation for 500 rounds per gun.

Dimensions.—Span 9.16 m. (30 ft. 1 in.), Length 6.72 m. (22 ft. 1 in.), Height 2.80 m. (6 ft. 10 in.), Wing area 16.6 sq. m. (179 sq. ft.).

Weights and Loadings.—(400 h.p. engine), Weight empty 869 kg (1,912 lbs.), Weight of fuel and oil 159 kg. (350 lbs.), Military load (including pilot) 178 kg. (391 lbs.), Loaded weight 1,206 kg. (2,6[illegible] lbs.), Wing loading 71.8 kg./sq. m. (14.8 lbs./sq. ft.), Power loading 2.68 kg./h.p. (6.6 lbs./h.p.).

Performance.—Maximum speed (sea level) 242 km.h. (150 m.p.h.), at 3,000 m. (9,840 ft.) 253 km.h. (157 m.p.h.), Climb to 3,000 m. (9,840 ft.) 5 mins. 57 secs., to 6,000 m. (19,680 ft.) 17 mins. 33 secs., Landing speed 104 km.h. (63 m.p.h.), Endurance 3 hours.

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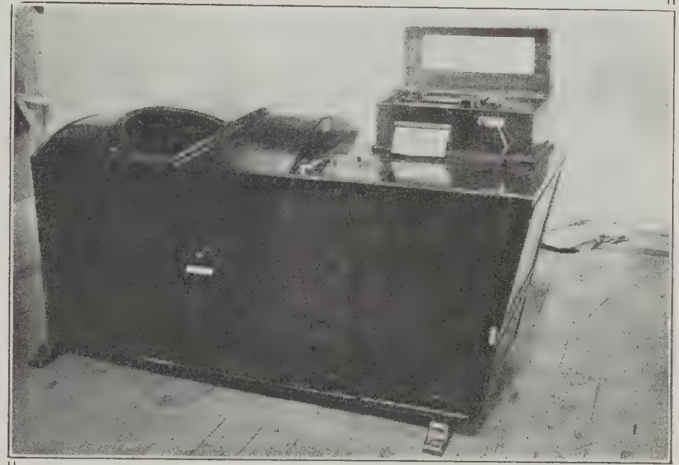

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(*Continued from page 765.*)

Sutherland, President of the Air League and Vice-President of the Royal Aero Club, proposed the health of Lady Heath.

Lady Heath in reply laid stress on the keen interest shown in our African Dominions in the possibilities of flying. She suggested that a fund ought to be raised to be devoted to helping approved candidates—particularly women candidates—from the Colonies to learn to fly at a low cost. She expressed her thanks to Lieut. Bentley and to Mrs. Bentley for the help they had given her on her journey. Particularly she desired to pay tribute to Mrs. Bentley's cheery and courageous way of facing the discomforts of the journey.

The Rt. Hon. Sir Hamar Greenwood thereafter proposed the toast of British Civil Aviation. Commenting on the fact that British Civil Aviation was on a very small scale when compared with similar activities by some foreign Powers, he said that as a Member of Parliament he could say that it was no use looking to Governments for more financial help. The taxpayers were already bled white. But there was plenty of private money available for development and it was up to us to get that money interested.

Sir Sefton Brancker, Director of Civil Aviation, in reply, agreed that the scale of British aviation was unsatisfactory, but argued that its quality was supremely good. The quantity was purely a matter of money. In Germany the sum paid in subsidy for Civil Aviation was 5½d. per head of population per annum, here it was 1¾d. only.

The Duke of Sutherland, acting as Vice-President of the Royal Aero Club, then presented the Britannia Trophy to Lieut. R. R. Bentley. In his remarks His Grace referred to Lieut. Bentley's services to the Hon. Lady Bailey and to Lady Heath in acting as escort over the Khartum—Mongalla section of their flights, and likened him firstly to Don Quixote and secondly to Don Juan. Under all the circumstances neither parallel seems quite happy.

Lieut. Bentley, after acknowledging the honour done to him, said that originally he had no intention of flying all the way to England, and none of taking his wife by air. His suggestion to his wife that she should fly to England with him was made on the spur of the moment, and her ready acceptance of it and her cheerful endurance of the discomforts of that flight were matters of which he was exceedingly proud.

Mrs. Bentley thereafter expressed the opinion that she was the luckiest girl in the World to have had the opportunity of making this flight.

"THE ARMY, NAVY AND AIR FORCE GAZETTE."

Those who have appreciated the many brilliant articles which have appeared in *The Army, Navy and Air Force Gazette* during the past twelve months will be interested to know that Major W. E. de B. Whittaker, The King's Regiment (R. of O.), has now taken over complete editorial control of that journal. The price of *The Army, Navy and Air Force Gazette* has been reduced from 1s. to 6d., its size has been increased, and by a rearrangement of type more information is being got into the space available.

Major Whittaker was intimately concerned with Aviation in its early days and was one of the first private owners of an aeroplane, his ownership unfortunately ending in a serious accident in 1911, which considerably deteriorated him and completely abolished the aeroplane. After that period Major Whittaker contributed a considerable number of articles to The Aeroplane on various aspects of Military Aviation, which articles were considered by experienced soldiers at the time as being of high value.

During the War 1914-18 Major Whittaker served in Flanders and in Gallipoli, and, when no longer fit for service overseas, he was on the Staff of Major-General Ashmore in the London Air Defence Area, in which capacity he gained considerable fresh experience of the possibilities of all such types of aircraft as existed at the end of the War.

Since then Major Whittaker has been in Palestine for *The Daily Express* and was War Correspondent of the same paper in Ireland. For the past five years he has been on the staff of *The Times*, and his military articles under the heading "Ten Years Ago" in that paper have been of high historical value.

Under his guidance *The Army, Navy and Air Force Gazette*, which is the oldest of all Service publications, should become a real force. Major Whittaker's knowledge of aircraft puts him in a unique position in dealing with the problems of war which involve air work, as all war does in these days.—C. G. G.

SIR ALAN COBHAM'S PROGRESS.

On May 26 Sir Alan Cobham and party left Casablanca in the Short Singapore (two Rolls-Royce Condor engines) and flew to Gibraltar.

He is due to arrive at Plymouth on May 31. He will be welcomed by the Mayor, and, on behalf of the Air Ministry, by Air Vice-Marshal Sir Sefton Brancker, Director of Civil Aviation. On June 1 he will fly from Plymouth to London, following the course of the Thames through the metropolis. He will time his arrival over London so as to coincide with the lunch hour. He will not alight on the Thames, but will continue to Hull, whence he will make a tour of seaports and coast towns of Great Britain with a view to interesting the public in marine aviation

SHOWING THE ITALIAN FLAG.

On May 26 a flotilla of sixty flying-boats of the Italian *Regia Aeronautica*, under the command of General the Marchese de Pinedo, left Ortobello on a practice cruise.

The official designation of the flotilla is the 1st Air Brigade, which is divided into two groups, known as Group 27 and Group 28, commanded by Colonel Lodi and Colonel Cassone. Each group is again sub-divided into three squadrons. Five squadrons are equipped with Savoia S.59 single-engined flying-boats, and the remaining squadron with Savoia S.55 twin-engined, twin-hulled flying-boats, all fitted with Isotta-Fraschini engines.

The Air Attachés of Great Britain, France, U.S.A., and Spain are accompanying the cruise in special aeroplanes.

The flotilla left Ortobello at regular intervals between 06.30 and 07.15 hours, and it reached Elmas, near Cagliari, Sardinia, at 09.45 hours. Within forty-five minutes all the machines had alighted at their appointed anchorages.

On May 27 the flotilla flew from Elmas to Majorca.

On May 28 it flew from Pollensa to Los Alcazares, near Cartagena, where they were received by the Italian Ambassador, the Infante Don Alfonso of Orleans, officer-commanding Los Alcazares, and the Spanish authorities.

THE ITALIAN POLAR EXPEDITION.

On May 23 the Italian airship *Italia*, commanded by General Nobile, left King's Bay, Spitzbergen, at 04.40 hrs. to fly over the North Pole and back.

At 01.20 hrs. on the following day it arrived over the Pole and at 03.30 hrs. it began its return journey.

Up to 09.00 hrs. on May 25 it was in constant wireless communication with the parent ship *Citta di Milano* at King's Bay but since then no further messages have been received.

The weather in the region of Spitzbergen has been very bad with fog and high wind and it was feared that the *Italia* might be driven across the Polar regions again towards Alaska.

In the meantime the *Citta di Milano* left King's Bay on May 27 to search for the missing airship.

On May 29 the *Citta di Milano* which had become icebound to the north of Spitzbergen, received a wireless message from a sealing ship which reported that it had received a message that was apparently sent out by the *Italia* to the effect that it had made a forced landing on Amsterdam Island to the north of Spitzbergen. A relief expedition is being despatched by the *Citta di Milano*.

AMPHIBIANS IN THE STATES.

An order for twenty Loening amphibians placed with the Loening Corporation by the U.S. Navy Bureau, seems to substantiate the claim that the United States leads all other nations in the use of amphibian aircraft.

Since Mr. Grover Loening perfected his particular type of tractor amphibian some three years ago, he has delivered 46 to the U.S. Air Corps, 44 to the Navy and Marine Corps, and 3 to the Coast Guard Service. These have all been fitted with either the inverted Packard or Liberty water-cooled engine. The twenty amphibians will be having 425 h.p. Pratt and Whitney Wasp air-cooled radials, which will save 500 pounds in weight in the machines and increase their performance.

The Loening Brothers deserve to be congratulated on their steadily progressive success with a type of aircraft which one has long considered to be the best in the World in its class.

C. G. G.

A JUNKERS MONOPLANE FOR NEW GUINEA.

Guinea Airways Ltd., which operates an air service for communication between the coast of New Guinea and the newly-developed gold mines in the interior, have purchased a Junkers type W.34 monoplane fitted with a Bristol Jupiter.

The gold-mining area is about 65 miles inland and at a height of about 10,000 ft. There is no road, and part of the only available track up the mountains is so steep that men traversing it have to haul themselves up by rope. The journey on foot takes eight days each way, and carriers have to take their food supply for the return journey as well as their "pay load." As a result each carrier is able to take a load of only about 40 lbs. (useful).

Air transport takes under one hour, and the Junkers W.34, which has a pay load of at least 1,500 lbs., can in one journey replace the work of 40 carriers for a fortnight or so. This looks distinctly like commercial aviation.

There is no possible landing ground between the coast and the inland terminal aerodrome, so that the choice of the Jupiter VI for this work is only natural.

In a letter to the Australian journal *Aircraft* Mr. E. A. Mustard, chief pilot to Guinea Airways Ltd., who tested the machine at Dessau, states that carrying a total load of 2,871 lbs. this machine reached 16,000 ft. in 30 mins., showed a top speed of 120 m.p.h. and took off in 130 yards. He considers that this performance can be improved, as the fuel used on the test was a mixture for which the engine was not properly tuned and, in addition, the test was made in intensely cold weather.

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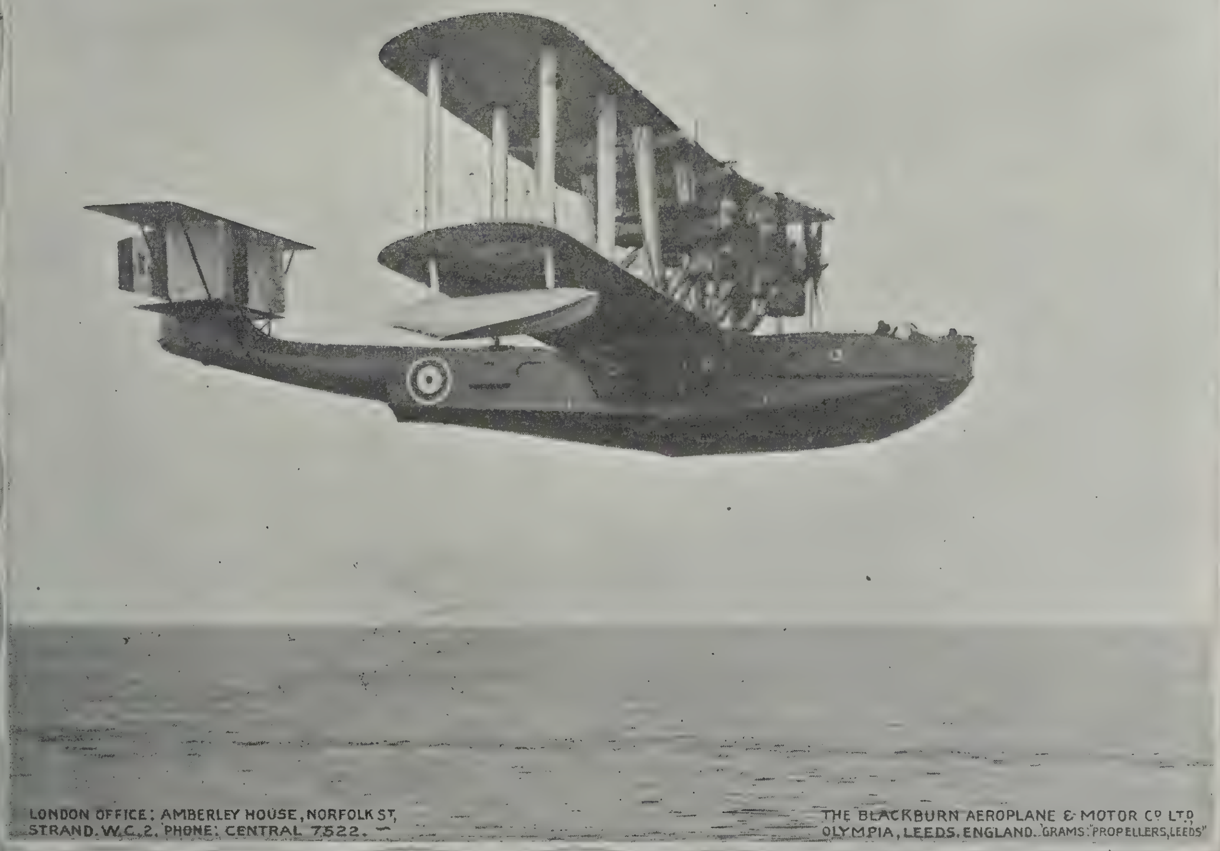
— IRIS —

"THE THREE-ENGINED BLACKBURN 'IRIS' with metal hull is one of the recent successful types of flying boat. A small production order has been placed for this type and it is believed that one of the new flying-boat flights referred to by Sir Samuel Hoare will be equipped with 'Iris' flying boats."

"THE NAVY," APRIL, 1928.



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THE ROYAL AIR FORCE.

The London Gazette.

May 22.

General Duties Branch.—The following Plt. Offs. on probation are confirmed in rank:—P. D. Cracroft (April 5); M. Fountain-Barber (April 12).

Plt. Off. on probation R. A. E. Birch resigns his S.S. comn. (May 19). The S.S. comn. of Plt. Off. on probation P. H. E. Grisewood is terminated on cessation of duty (May 9).

Medical Branch.—The following are granted S.S. comns. in the rank of Flg. Off. for three years on the Active List with effect from and with seniority of May 2:—J. H. Cullinan, T. A. Edwards, A. R. French, P. J. Nyhan, M.B., B. A. Porrit, M.B.

Flt. Lt. (Hon. Sq. Ldr.) F. W. Squair, M.B., Ch.B., relinquishes his temp. comn. on completion of service and is permitted to retain the honorary rank of Sq. Ldr. (May 16).

Reserve of Air Force Officers.—General Duties Branch.—The following are granted comns. in Class A in the rank stated (May 22):—Flg. Off.—J. R. Cox. Flg. Offs. on Probation.—C. Byron, W. E. Hall, A. W. Simon.

Flg. Off. A. J. Stubbings relinquishes his comn. on completion of service (Mar. 31); Flg. Off. G. H. Winckworth is transferred from Class B to Class C (May 18). The following officers resign their comns.:—Flt. Lt. J. F. Stallard (Jan. 24); Flg. Off. A. R. Latham (April 3). Flg. Off. H. A. Hince relinquishes his comn. on account of ill-health and is permitted to retain his rank (May 23).

Princess Mary's R.A.F. Nursing Service.—Sister (Acting Matron) Miss J. MacLeod, A.R.R.C., resigns her appointment (April 24).

Appointments.

Week ending May 28.

General Duties Branch.—Air Vice-Marshals F. R. Scarlett, C.B., D.S.O., to H.Q., Air Defence of Great Britain, Uxbridge, on appointment as Air Officer Commanding-in-Chief, 26/5. C. L. Lambe, C.B., C.M.G., D.S.O., to H.Q., Coastal Area, on appointment as Air Officer Commanding, 15/5.

Group Captain E. D. M. Robertson, D.F.C., to R.A.F. Depot, Uxbridge, 4/5.

Squadron Leaders E. R. Vaisey, to R.A.F. Depot, Uxbridge, 31/3. H. A. Whistler, D.S.O., D.F.C., to R.A.F. Depot, Uxbridge, 4/5.

Flight Lieutenants H. Hackney, to No. 58 Sqdn., Worthy Down, 8/5. G. R. Ashton, to No. 1 School of T.T. (Apprentices), Halton, 20/5. K. L. Boswell, to R.A.F. Depot, Uxbridge, 22/3. T. C. Traill, D.F.C., to Cambridge University Air Sqdn., 31/3. E. J. D. Routh, to No. 16 Sqdn., Old Sarum, 30/5. O. G. Gregson, to R.A.F. Depot, Uxbridge, 23/5. E. H. Spence, to R.A.F. Training Base, Leuchars, 30/5.

Flying Officers B. S. Brice, A.F.C., to R.A.F. Depot, Uxbridge, 1/5. F. G. S. Wilson, to R.A.F.M.T. Depot, Shrewsbury, 31/5. A. H. Montgomery, to H.Q., A.D.G.B., Uxbridge, 21/5. A. I. Riley, A.F.C., to R.A.F. Depot, Uxbridge, 5/5. E. A. Healy, to C.F.S., Wittering, 22/5. A. R. Hamilton, to No. 13 Sqdn., Andover, 4/5. R. Scott-Taylor, to C.F.S., Wittering, 20/4.

Pilot Officers F. H. L. Searl, to No. 23 Sqdn., Kenley, instead of to No. 17 Sqdn., as previously notified, 5/4. B. A. J. Crummy, to Armoured Car Wing, 'Iraq, 1/5. A. R. S. Davies, to No. 70 Sqdn., 'Iray, 4/5. J. E. McCann, to R.A.F. Depot, Uxbridge, 5/5.

Accountant Branch.—Flight Lieutenant A. E. Vautier, to H.Q., Coastal Area, 27/4.

Flying Officers W. R. Donkin, to R.A.F. Depot, Uxbridge, 31/3. J. Charles, to No. 47 Sqdn., Middle East, 26/4. A. F. West, to No. 2 Arm. Car Coy., Middle East, 8/5.

The Prince of Wales.

H.R.H. the Prince of Wales made the first practical use of the Bristol Fighter placed at his disposal for travelling purposes on Sunday, June 27.

Piloted by Flt. Lt. D. S. Don, R.A.F., of No. 24 (Communications) Squadron, he flew from Scarborough racecourse to Bircham Newton Aerodrome, which is six miles from Sandringham.

The Prince had been to Scarborough for the British Legion Conference, and he flew to Sandringham for dinner with Their Majesties the King and Queen.

The Prince's Equerry also made the journey in another machine.

Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident near Paisley to an Avro machine of No. 602 City of Glasgow (Bombing) Sqdn., Auxiliary Air Force, on May 21, Plt. Off. James Pearson Drew, Auxiliary Air Force, the pilot and sole occupant of the aircraft, was killed.

According to newspaper reports Mr. Drew was doing a series of loops with decreasing height and struck the ground.

A Fatal Car Accident.

A Reuter message from Baghdad, dated May 27, says:—

Flt. Lt. William L. Fenwick and Flg. Off. Edward B. Foster, both attached to the 84th Squadron, R.A.F., were killed in a motor-car accident in Baghdad last night.

The Far-East Cruise.

The Service cruise of four Supermarine Southampton flying-boats (Napier Lion engines), under the command of Group-Capt. Cave-Browne-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17, 1927, arrived at Batavia, Java, on May 23 from Klabat Bay, Banka Island.

The R.A.F. Display.

The R.A.F. Display will take place on Saturday, June 30, at Hendon Aerodrome. Gates will open at 10 a.m. Flying will start at 12.00 hrs. and will continue until 18.00 hrs.

The "set piece" will be an attack on an oil refinery, which will be seen blazing after an intensive bombardment.

There will be the ever-popular destruction of a kite-balloon, whereby the veteran Major Sandbags (or should he be Squadron Leader Sandbags?) will earn yet another bar to his O.B.E.

Most of the usual items will be given, with several extra ones as well.

In the new machine park there will be exhibited the Beardmore Inflexible, the Supermarine S.5, and some of the new Interceptor Fighters.

The Handley Page slot will be much in evidence, and by its aid some new sensations are promised.

The Sassoon Cup Competition.

Hornchurch, until last week known as Sutton's Farm, was chosen for the final of the competition between Fighter Squadrons of the R.A.F. for the Sassoon Cup. Since it was an aerodrome for Units engaged in the Defence of London during the War, Hornchurch has been entirely rebuilt, and a new piece of land has been included in the original aerodrome.

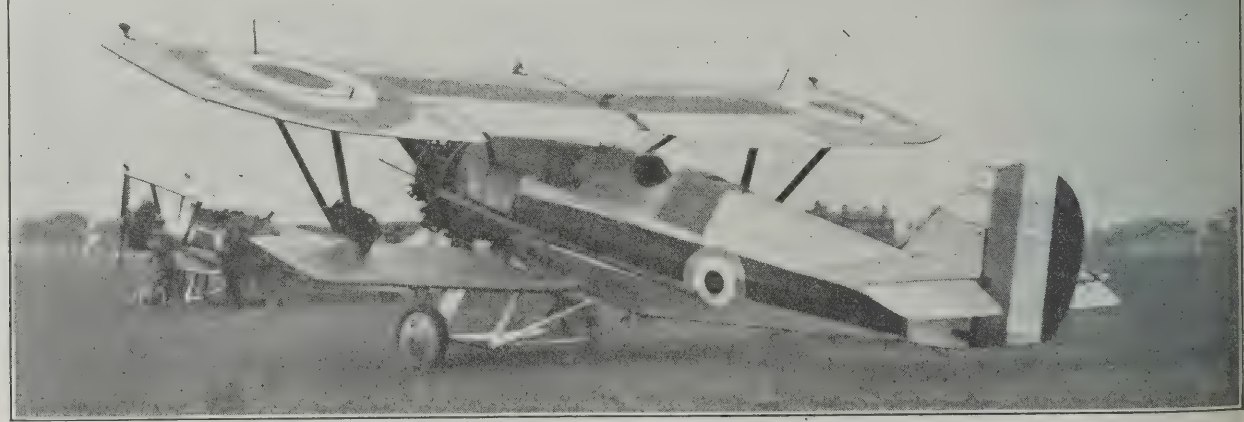
There is accommodation for two Squadrons. One of them, No. 111 (Fighter) Squadron, is already established there. The second, one understands, is to be a new Fighter Squadron not yet formed.

The eliminating trials for the Sassoon Cup take place within the Squadrons and one representative of each Squadron competes in the Final.

The race is a handicap and a few alterations have been made in the regulations since last year. This year no special fuel was allowed and no form of streamlining or otherwise "hotting-up" the machines was permitted. The machines race as standard Service machines, with guns, but without wireless or ammunition. The pilots are not allowed to open out their engines beyond the limit fixed for flying below 6,000 ft.

The Cup was won last year by Flg. Off. A. H. Montgomery of No. 32 (Fighter) Squadron.

In order to avoid crowding at the turns the race was flown this year in two heats, one starting immediately after



THE SASSOON CUP.—The Siskin IIIa (Armstrong-Siddeley Supercharged Jaguar engine), which, piloted by Flg. Off. H. T. Andrews, of No. 41 (Fighter) Squadron, won the 1928 Sassoon Cup.—(*"Aeroplane" photograph.*)

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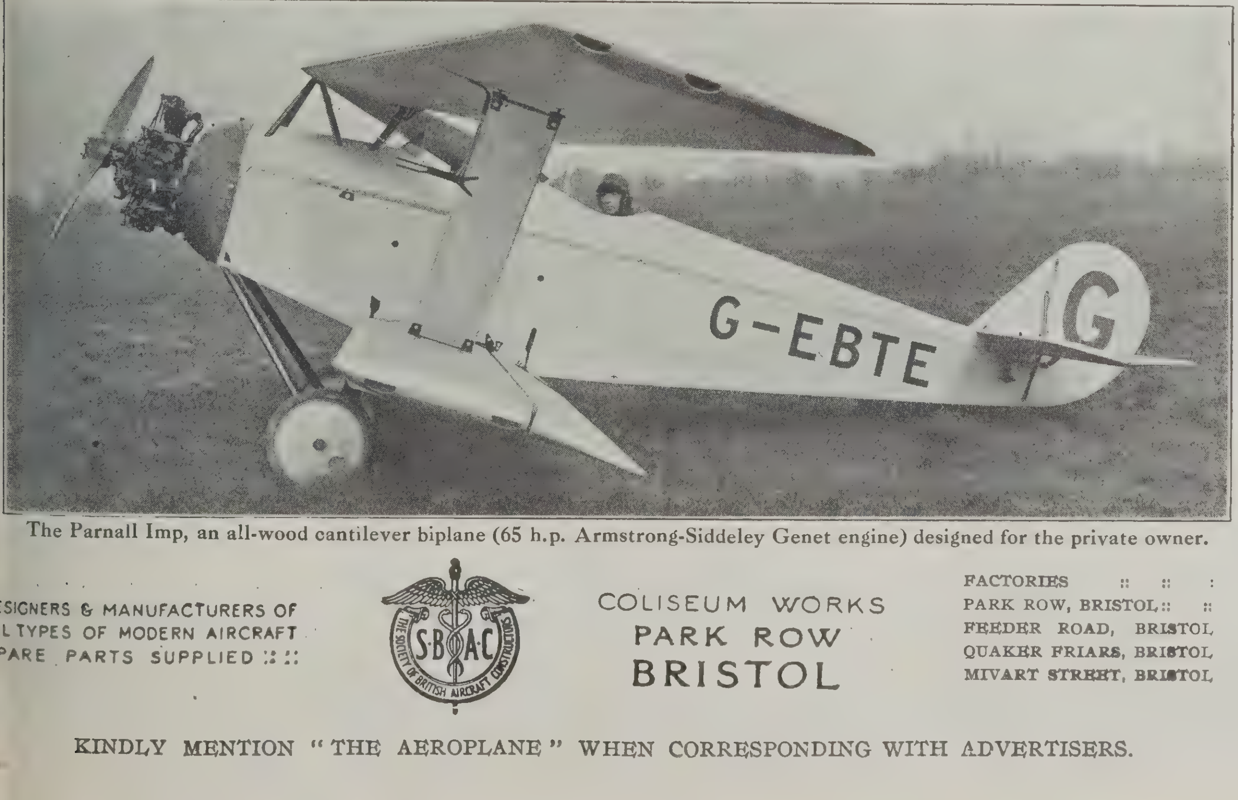

The Parnall Imp, an all-wood cantilever biplane (65 h.p. Armstrong-Siddeley Genet engine) designed for the private owner.

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the other, a measure which makes for safety and economy of time, but spoils the race as a spectacle because the winner is not known until the turns have been worked out, although the handicapping is done before the start.

The race consisted of two laps of a three-point course with turns at Leigh and Chelmsford of 95 miles, and pilots had to fly over 1,000 ft. until the finish, when they were allowed to come as low as they liked to cross the finishing line.

This year's winner was Flg. Off. H. T. Andrews, of No. 41 (Fighter) Squadron, on an Armstrong-Siddeley Siskin (Jaguar engine), who completed the course in 42 min. 26 sec.

Sq. Ldr. E. O. Grenfell, No. 1 (Fighter) Squadron, was second, also on a Siskin (Jaguar engine), and Pilot Sjt. W. Kerswell, No. 111 (Fighter) Squadron, first man home, was third, also on a Siskin.

Flt. Lt. H. C. Calvey, No. 23 (Fighter) Squadron, on a Gloster Gamecock (Jupiter engine), did the fastest time, about 150 m.p.h., his total over the whole course being 38 min.,—which was 4 min. and 26 sec. faster than the winner.

Flt. Lt. L. H. Browning, M.C., D.F.C., No. 3 (Fighter) Squadron, flying a Woodcock (Jupiter engine), was disqualified for flying below 1,000 ft.

Pilot Sjt. T. W. Morton, of No. 29 (Fighter) Squadron, had to make a forced landing but was unhurt.

The speed of the winning machine was 134½ m.p.h. This seems to call for a spell of unwonted activity in the near future in the Department of Supply and Research, when one recalls that in last year's race the winning machine, a Gamecock (Bristol Jupiter engine), averaged 156 m.p.h.

C. M. MCA.

The Royal Tournament.

The Royal Tournament, which opened at Olympia on May 24, is better than ever and should not be missed by anyone who is interested in the Services or who enjoy a first-class spectacle.

At the official lunch which preceded the Dress Rehearsal of the Tournament, Major-General C. E. Corkran, C.B., C.M.G., welcoming the Press, who were the guests of the Committee of the Tournament, said that an extraordinary sympathy existed between the Press and the Services. The fact that since the War over £100,000 had been handed to the Service charities through the Tournament was due in no small measure to the Press, who had the well-founded trust of the British Public.

Replying for the Press, Mr. Gwynne, of *The Morning Post*, said that the Press always enjoyed the Tournament and did not look upon it as a duty. All journalists considered it the best show in London.

The Royal Tournament opened as usual with the Royal Naval and Inter-Port Field-Gun Competition which, except for the natural pleasure everyone has in sitting and watching other people sweat, leaves a certain amount to be desired in the way of the artistic exposition of the poetry of human endeavour. However, the Commander, R.N., in whose charge one lunched, promised a fresh Naval programme in future years.

The mounted display by the School of Equitation, Weedon, was even better than usual, perhaps as an anti-Tank gesture. The final salute with their saddles held high over their heads was particularly effective.

The accident which marred the Musical Drive by "M" Battery, R.H.A., at the rehearsal only served to illustrate the amazing efficiency of the organisation of the Tournament. What looked like a hopeless confusion of men, horses, and gun-trappings was sorted out, removed from the arena and replaced by a reserve team almost before the spectators realised what had happened.

The Display of Physical Training by recruits of the R.A.F. from the Depôt at Uxbridge included some examples from the new physical training manual and include a sort of Highland reel step. The display, which is performed without words of command or a whistle but to the music of the Band, is a particularly attractive and graceful one and comes in for an exceptional burst of applause from the spectators.

The Drill Display by Recruits of the Guards Depôt is fascinating with its "spell of ordered motion." The Guardsmen handle their 10 lb. 5 oz. rifles as though they weighed no more than a few ounces.

The other items on the programme include a "wooden soldier" drill by the boys from the Duke of York's School, a Riding and Driving Display by the R.A.S.C., a Gymnastic Display by the Army P.T. Staff, a Musical Ride by the Royal Scots Greys, a Trick-Riding Display by the 17th/21st Lancers. All of them are delightful.

The "set-piece" is a Historical Display by the Royal Scots Fusiliers, the Regiment of which Major-General Sir Hugh Trenchard, G.C.B., D.S.O., is Colonel. The Display opens with the entry of a present-day Guard of Honour with the King's Colour and the Regimental Colour. The second phase shows an episode from the Regiment's History in an incident in the Battle of Inkerman, and this is followed by a march-past of squads in the different uniforms of the Regiment from 1678 to the present day.

The Royal Tournament does not rest on its laurels; it gets better every year.—C. M. MCA.

The Air Minister's Cruise.

The Secretary of State for Air, Sir Samuel Hoare, accompanied by Air Vice-Marshal Sir John Higgins, Air Member for Supply and Research, and a private Secretary, will make a two-days' cruise along the South Coast and to the Channel Islands and the Scilly Islands during the Whitsun recess in a Short Calcutta flying-boat with three Bristol Jupiter engines.

The machine left Calshot on May 29 and alighted at Jersey for lunch. From there it went to Cattewater where it moored for the night.

Army Officers and Flying.

The position of Army Officers with regard to flying duties was discussed in the House of Commons on May 22.

Mr. Cooper, replying for the Secretary of State for War to a question by Sir Robert Thomas, said that the attention of young officers joining the Army was not specifically drawn to Army Order 304 of 1924 (under which they might be called upon to fly) which formed part of the standing orders of the Army. No Army Officer was called upon to fly as a pilot unless he volunteered for such duty. Officers who were called upon to fly as passengers or for reconnaissance purposes and who proved themselves unfitted for this work would be released from the duty. Officers were not compelled to fly as pilots but they were as passengers. He could hardly believe that any Army Officer would be afraid to go up in an aeroplane and he had not had any complaint from any officer serving in the Army on these grounds.

Sir Robert Thomas said that Lieut. Scott of the Essex Regiment, who recently lost his life, objected to flying and was compelled to do so as a passenger.

The Aldershot Accident.

The following account of the recent accident at Aldershot appeared in *The Times* of May 26 :—

> The inquest was resumed at Aldershot on Friday on the bodies of Telegraphist Percival Carter and AC. James Bolton, Royal Air Force, who died from injuries received when a Fairey aeroplane crashed at Farnborough, Hants, on May 12. The pilot, Capt. J. E. Ellison, Royal Marines, who was brought into the Court-room on a wheeled chair, stated that he flew the machine from Gosport on a wireless telegraphy exercise. When nearing Farnborough, and 3,000 ft. up, he throttled back the engine, instructed Carter to reel in the aerial, glided to between 1,000 ft. and 800 ft., and started to do an "S" turn to lose height. When he got into this turn he noticed the machine seemed to turn very quickly. He tried to correct it, but could not make any impression on the rudder. He fought the machine in the air, but to no avail. He saw nothing jamming up the rudder pedals, and his only theory was that possibly the aerial might have fouled the rudder. He was practically certain the cause of the accident was his inability to work the rudder. A verdict of "Accidental death" was returned.

Specialisation by Short Service Officers.

Air Ministry Orders give the names of the following officers as having qualified for the courses indicated against their names, at the examination held last March for specialisation with a view to being granted permanent commissions. "E"=Engineering course beginning at the Home Aircraft Depot, Henlow on Aug. 1; "S"=Signals course beginning at Flowerdown on Aug. 14; and "A"= Armament course at Eastchurch beginning on Aug. 1.

Flg. Offs. J. A. Hawkinge (E), H. R. Bardon (E) C. A. Bell (S), W. T. Holmes (S), A. C. H. Sharp (A), E. E Fallick (E), L. T. Pankhurst (E), F. C. Rowland (E) T. P. F. P. Fagan (S), H. A. Evans-Evans (S), J. D Greaves (S) and F. Boston (E).

The service on the Active List of Flg. Offs. Holmes, Sharp Rowland and Boston, who are due to transfer to the Reserve, is extended pending their consideration for permanen commissions on the results of their training.

The Fleet Air Arm.

The Henry Leigh Carslake Prize for this year has bee awarded to Lieutenant-Commander Lachlan D. Mackintosh D.S.C., of H.M.S. *Courageous*. Consisting of a silver medal together with a sum of money for the purchase of books an instruments, this prize was instituted in memory of the lat Lieutenant Henry Leigh Carslake and is awarded annuall to the Naval Observer who has completed his training as suc and who, in the opinion of the Admiralty, submits the bes essay dealing with the Fleet Air Arm.

A Fleet Order states that steps are to be taken to ensur that the invitation to petty officer telegraphists to voluntee for the rating of telegraphist air gunner for duty in the Flee Air Arm is brought to the notice of these ratings, as an insufficient number of candidates for the course has been received. Telegraphist air gunners receive an allowance c 2s. a day while allocated for the duty, and 1s. a day whil under training for each day of ascent.

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"——When the engine was throttled back suddenly during a climbing turn, and the machine was stalled on the turn, it was still possible to raise the lower wing by normal use of the 'stick.' It is this kind of climbing turn that, in conjunction with engine failure or loss of power, has killed so many pilots in the past, and it can be said definitely that the automatic slots have reduced its dangers almost to vanishing point."

"MORNING POST,"
8th May, 1928.

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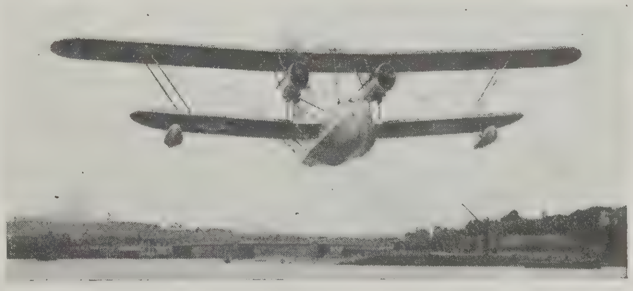

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THE ROYAL AERONAUTICAL SOCIETY.

The sixteenth annual Wilbur Wright Memorial Lecture is to be given before the Royal Aeronautical Society on Wednesday, May 30—the day on which this paper is published. As the Society does not appear to have issued any notification of this event in time to have allowed of an earlier notice in THE AEROPLANE, it must be hoped that readers who desire to attend the meeting will receive earlier notifications through other channels.

The lecture on this occasion is by Mr. F. Handley Page and the subject "The Slotted Wing" and the meeting is at 6.30 p.m. at the Royal Society of Arts, John Street, Adelphi.

On Friday, June 1, Lieut. R. R. Bentley, A.F.C., S.A.A.F., will lecture before the Royal Aeronautical Society on the technical aspects of his flights to and from South Africa. The place is again the Royal Society of Arts and the time 6.30 p.m.

On or about June 14, Capt. G. H. Wilkins, M.C., has promised to deliver a lecture on his recent flight across the Arctic from Alaska to Spitzbergen. Further information as to this event will be given as soon as possible.

U.S. TRANSCONTINENTAL AIR TRANSPORT.

On May 15 a company known as the Transcontinental Air Transport, Inc., was formed in New York with a capital of $5,000,000 (£1,000,000). The new company has been organised by two of the leading aircraft companies, the Curtiss Aeroplane and Motor Co. and the Wright Aeronautical Corporation, two of the largest railroad companies, the Pennsylvania and the Aitchison, Topeka and Santa Fé Railroads and a group of banks, headed by Blair and Co., of New York, to operate combined air and rail transport.

The initial route to be operated will be from New York to Los Angeles, a distance of 3,000 miles, and by combining air and rail passenger transport over the route, flying by day and travelling in railway sleepers by night it is estimated that the present rail time of four days will be halved. Passengers leaving New York in the evening will arrive at Los Angeles on the afternoon of the second day at a total cost little more than the normal first-class rail fare.

The Trans-Continental Air Mail route was operated at first on this same plan, until Col. Paul Henderson, the Assistant Postmaster-General, organised the simple yet efficient night-flying system which has proved so effective ever since.

The President of the new company is Mr. C. M. Keys, of the Curtiss Company, and Colonel Charles Lindbergh has become actively associated with the project in the capacity of chairman of the Company's Technical Committee.

A RECORD ATTEMPT.

On or about June 6 or 7 Mr. Charles Barnard, accompanied by Mr. E. H. Alliott as second pilot, with the Duchess of Bedford as passenger, will attempt to fly to Karachi and back within eight days. The journey each way will be made in four hops, with intermediate stops at Sofia, Aleppo, and Bushire.

The machine will be a Fokker F.VIIa, with a Bristol Jupiter engine. Over and above the petrol and the two pilots the machine will be capable of carrying an extra 1,000 lbs. without being overloaded. That is to say, that it will be capable of making a high-speed flight to India carrying six passengers and their luggage.

There are distinct commercial possibilities about such a flight. Many people stationed in India would gladly pay extra fare to get to England in four days instead of three weeks, particularly for those with limited leave.

THE FLYING CLUBS.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending May 19.

Flying Time 19 hr. 15 min. *Instruction* 8 hr. 40 min. *Soloists* 5 hr. 10 min. *Passenger Flights* 4 hr. 35 min. *Tests* 50 min. *Instruction.—With Mr. Baker*—Miss Baerlein, Messrs. Gattrill, Chart, Sellers, Benson, Weale, Goss, Brooking, Harrison, Mills, Tweedale, Garner, Gort, Secker, Riley, Taylor, W., Hartley, Crosthwaite, Barlow, Stern. *With Mr. Scholes.*—Messrs. Goss, Riley. *Soloists (under instruction).*—Messrs. Tweedale, Mills, Stern, Riley. *Pilots.*—Messrs. Michelson, Hall, Cohen, Crosthwaite, Twemlow, Nelson, M., Meads, Lacayo, Goo fellow, Cantrill, Gattrill, Baker. *Passengers carried.*—14.

An excellent first solo by Mr. Riley, counterbalanced by an unfortunate third solo by Mr. Stern. Our Moth, MQ, is still serviceab

The Newcastle-upon-Tyne Aero Club.

[Sec.: J. T. Dodds, Cramlington Aerodrome, Northumberland.]

Report for week ending May 27.

Flying Time 25 hr. *Instruction* 5 hr. 25 min. *Soloists* 1 h 15 min. *"A" Pilots* 13 hr. 25 min. *Passengers* 3 hr. 30 min. *Tes* 1 hr. 5 min. *Instruction.—With Mr. J. D. Parkinson*—Mrs. Kish, Mis Klyver, Capt. Lynden Bell, Messrs. Temple, R. G. Lawson, J. M Kennedy Hayton, V. Heaton, Redshaw, Dr. Alderson. *Soloist.*—Mr. Redshaw. *"A" Pilots.*—Mrs. Heslop, Lieut. Hanney, Messrs. d Pledge, W. B. Ellis, Phillips, Davey, Wilson, Heppell, Runcima Turnbull, R. N. Thompson, C. Thompson, Robertson, Irving, N. Todd, Lloyd Browne, A. Bell, Dr. H. B. L. Dixon, Dr. R. E. Alderso *Passengers carried.*—3.

Mr. Wallace, flying his Moth, G-EBPM, called at the aerodrome o Saturday, en route for Scotland.

Mr. A. H. Bell, who has been Secretary of the Club since its in ception, has resigned to take up an appointment in commercial avi tion, and Mr. J. T. Dodds has been appointed Secretary.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. J. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending May 26.

Flying Time 22 hr. 25 min. *Instruction* 14 hr. 45 min. *Soloists* 6 h 40 min. *Passengers* 1 hr. *Instruction.—With Mr. Beck*—Messrs. Arunde A. Crowther, H. Crowther, Daly, Fitton, Gill, Harral, Lupton, Littl Ostler, Reynolds, Roberts, A. Senior, G. Senior, Shires, Miss Wilso *Soloists.*—Messrs. D. Atcherley, A. Crowther, Dick. *"A" Pilots.*—Messrs. Ambler, Birch, Clayton, H. Crowther, Ellison, Lister Thomso Wood. *"B" Pilot.*—Mr. Fielden. *Passengers carried.*—5.

This week has been more like a week in January from the weathe point of view and consequently somewhat uneventful. We have, how ever, had a welcome visitor in the shape of Mr. Jock Cameron, o the Cornwall Aviation Company, who cast a further gloom over Leed by trailing an enormous opaque sheet between the sun and the alread smoke-darkened city.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston.]

Report for week ending May 27.

Flying Time 18 hr. 5 min. *Instruction.—With Mr. Young*—Messrs H. P. Clarke, H. Birkin, E. Vardon Smith, A. G. Woods, H. Neav A. A. Rice. *Soloists.*—Messrs. H. Birkin, E. Lambert, W. P. Cubit R. Potter, G. Barker, N. Brett, F. Gough, G. F. Surtees, H. Mack W. A. Ramsay, R. W. Moore. *Passengers carried.*—18.

Our Moth, G-EBQX, has at last returned from Stag Lane afte extensive repairs. She looks like a new machine and appears non the worse for the experience of having "hit the deck" with rathe more force than necessary.

Everything is being pushed in the background in preparation fo the big day on Wednesday. Members flock up like bees and get a busy, hammering in stakes, posts, rails, etc., for the enclosures. On watches a car drive up on to the car park, member climbs out, peel off his jacket, collar, tie and several other things and then seize a "beetle" with which he performs a series of violent exercise which would eclipse Sandow.

We are pleased to report Messrs. H. Mack, N. Brett and R. Potter have been granted "A" licences.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending May 26.

Flying Time 19 hr. 50 min. *Instruction* 11 hr. 50 min. *Soloists (unde instruction)* 2 hr. 30 min. *Soloists Flying* 2 hr. 15 min. *Passengers (flights)* 1 hr. 10 min. *Instruction.—With Mr. Bartlett*—Messrs. Lynas Button, Hughes, R. S. W. Clarke, T. H. Clarke, Girdlestone, Arnold Moss, Chopra, Peters, Bathurst, and Miss Huggett. *With M Tratman*—Messrs. Button and Stephens.

Arrangements have been made whereby two Moths are now avail able for flying pending the arrival of the new machine with slotte wings; there is therefore no shortage of machines for instructiona purposes. Pilot members should note this.

FLYING SCHOOLS.

The Henderson Flying School.

[Manager: A. A. Anderson, Brooklands Aerodrome, Byfleet.]

Report for week ending May 24.

Flying Time 36 hr. 5 min. *Instruction.—With Col. G. L. P Henderson*—Messrs. Bellville, Carlos, Brooks. *With Mr. H. D. Davis*—Messrs. Barclay, Oliver, Saunders, Murray-Philipson, Hamilton, Dr Wall, Messrs. Payne, Bennett, Dr. Forsyth, Miss Kidston. *Soloists*—Messrs. Allen, Barclay, Patton Bethune, Oliver, Murray-Philipson, Dr Wall, Messrs. Hughes, Hamilton.

On Thursday night we passed out Messrs. Allen, Barclay, Patto Bethune in night flying tests for their "B" Licences, at Croydon.

Mr. Hughes has now passed all his tests for his R.Ae.C. Licence

Several new pupils have arrived and the School is making ver rapid progress

Mr. Murray-Philipson has taken delivery of his Moth and was flyin hard until dark on Friday, getting used to it.

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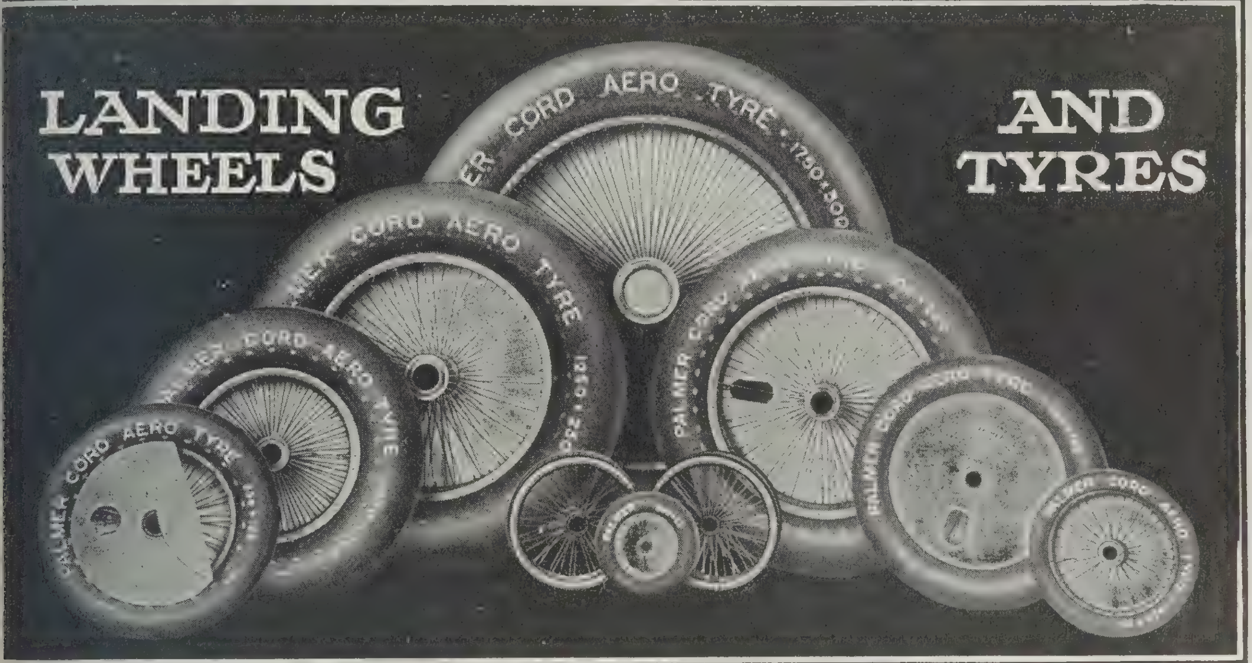

STANDARD SIZES

Tyre Size	Wheel No.	Hub Length	Hub Bore	Track Line
		m/m	m/m	m/m
375 × 55	168	111.12	25.4	Central
300 × 60	16	111.12	25.4	Central
450 × 60	30	89.	31.75	Central
"	172	130.	38.09	Central
575 × 60	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	90	150.	38.09	Central
650 × 65	78	178.	44.45	132 46
"	79	178.	44.45	Central
"	100	178.	38.09	132/46
"	101	178.	31.75	132 46
800 × 75	21	160.	28.	Central
"	180	150.	38.09	104/46
"	186	120.	34.92	Central
"	190	150.	38.09	Central
700 × 75	78	178.	44.45	132/46
"	79	178.	44.45	Central
"	100	178.	38.09	132 46
"	101	178.	31.75	132/46
00 × 100	77	178.	44.45	132 46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
700 × 100	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
650 × 125	119	178.	55.	132/46
"	147	178.	55.	Central
"	188	120.	34.92	Central
750 × 125	77	178.	44.45	132/46
"	92	185.	55.	135/50
"	95	185.	55.	Central
"	99	178.	38.89	132/46
"	112	150.	38.09	Central
"	176	178.	44.45	Central
"	179	178.	55.	132/46
800 × 150	161*	185.	55.	135/50
"	162*	185.	55.	Central
"	163*	185.	66.67	135/50
"	169†	185.	55.	135/50
"	177	185.	55.	135/50
"	183	185.	55.	Central
"	211*	185.	60.32	135 50
1000 × 150	167	185	55.	125/60
"	174	250	80.	Central
"	182	185.	55.	Central
"	187	220.	66.67	Central
"	201	185.	60.32	125/60
1000 × 150	210	185.	60.32	Central
1000 × 180	148	220.	80.	Central
"	149	185.	55.	Central
"	155	220.	66.67	Central
"	166	185.	55.	125/60
900 × 200	107	185.	55.	Central
"	108	185.	55.	125/60
"	128	220.	66.67	Central
"	137	250.	80.	Central
"	157	185.	80.	Central
"	202	185.	60.32	Central
1100 × 220	134	220.	66.67	Central
"	136	250.	80.	Central
975 × 225	192	185.	60.32	Central
"	194	185.	55.	125/60
1250 × 250	133	250.	80.	Central
"	154	304.8	101.6	Central
1500 × 300	115	304.8	101.6	Central
"	126	304.8	152.4	Central
1750 × 300	139	400.	152.4	Central
"	191	350.	150.3	Central
1750 × 350	193	400.	125.	Central

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(365)

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 11; Monday, 29; Tuesday, 35; Wednesday, 30; Thursday, 28; Friday, 33; Saturday, 31.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brussels — Cologne: Machines 79, passengers 603, freight 17 tons.

Air Union:
Paris—London: Machines 43, passengers 214, freight 14 tons.

K.L.M.:
Amsterdam—Rotterdam—London: Machines 26, passengers 144, freight 7 tons.

Sabena:
Brussels—London: Machines 13, passengers 42, freight 1½ tons.

Deutsche Lufthansa AG.:
Amsterdam—London: Machines 26, passengers 50.

Private:
Machines 9, passengers 9.

Total number of trips by British Machines, 88, carrying 612 passengers. Foreign Machines, 111, carrying 450 passengers.

COMPARATIVE FIGURES.

Week ending May 26:
Machines, 197; Passengers, 1,062; Crews, 357; Total personnel, 1,419

Corresponding week, 1927:
Machines, 135; Passengers, 689; Crews, 221; Total personnel, 910.

Corresponding week, 1926:
Machines, 139; Passengers, 701; Crews, 181; Total personnel, 882.

Corresponding week, 1925:
Machines, 135; Passsengers, 555; Crews, 173; Total personnel, 728

Corresponding week, 1924:
Machines, 82; Passengers, 321; Crews, 130; Total personnel, 451.

Corresponding week, 1923:
Machines, 103; Passengers, 285; Crews, 168; Total personnel, 453.

Corresponding week, 1922:
Machines, 150; Passengers, 339; Crews, 207; Total personnel, 546.

Corresponding week, 1921:
Machines, 85; Passengers, 339; Crews, 101; Total personnel, 440.

Corresponding week, 1920:
Machines, 89; Passengers, 126; Crews, 100; Total personnel, 226.

Croydon Notes.

The introduction of the practical light aeroplane has made the private ownership of such a machine a relatively commonplace matter. The arrival at Croydon on May 25 of a Fokker F.III-3m with three Armstrong-Siddeley Lynx engines belonging to Mr. Lowenstein, may perhaps mark the beginning of private ownership of a new class. That this may be the case is further suggested by the news that another similar privately-owned machine is expected within a few days. This is the property of Mr. Holt, who like Mr. Lowenstein is great figure in the world of finance, and who has alread done a fair amount of flying in chartered aeroplanes.

Mr. Lowenstein's machine was delivered at Croydon by Lt Koppen, famous for his flight to the Dutch East Indies o another machine of the same type. Croydon is to be its mai base, and it will, it is said, be housed and looked after b Imperial Airways.

Mr. Holt has secured the services of Mr. R. H. Macintos as his pilot, and he is also to use Croydon as his base o operation

The public enclosure at the aerodrome is now growin quite popular, though the nuisance of passing cars pulling u all over the road to watch the flying has not yet been abate Last week a refreshment tent was erected in this enclosur apparently to deal with an expected crowd of spectators ove the holiday week-end. According to the reports this ex pectation was justified, and quite a lot of business in the wa of joy-riding was shared between Imperial Airways and Surre Flying Services.

There is quite a lot of flying to be seen at Croydon nowa days, and the public are beginning to recognise this at last.

The imminence of the Whitsun holiday has had its norma effect on traffic, and there has been a marked demand fo passages to Berck for Le Touquet during the week. Th sudden spell of fine weather starting on Friday added to th rush, and on Friday and Saturday nearly two hundred pa sengers passed through Croydon on each day.

As at Easter there was a flow southward of private aircraf Mr. Henry Petre on his Moth, and Mr. Kennedy on a Boultc and Paul P.9 left for France on Tuesday, on Friday M Bonner on an Avro Avian left for Berck, and on Saturday L Glen Kidston, R.N., went to Paris on his Moth.

The D.H.9 belonging to A.D.C. Aircraft Ltd., piloted by M Stack, was chartered to take two passengers to Berck on Fr day, and Mr. Hope of Air Taxis Ltd. took a party to Par on Saturday. Over and above this the private-charter d partment of Imperial Airways has been very fully occupied.

OPENING THE ROAD TO INDIA.

Major G. Woods Humphery, the general manager Imperial Airways, left London on May 24 on a visit to t Middle East. His main purpose is to confer with the Persi Authorities and to arrange with them for the passage ov Persian territory of Imperial Airways machines from Bas to the frontier of India.

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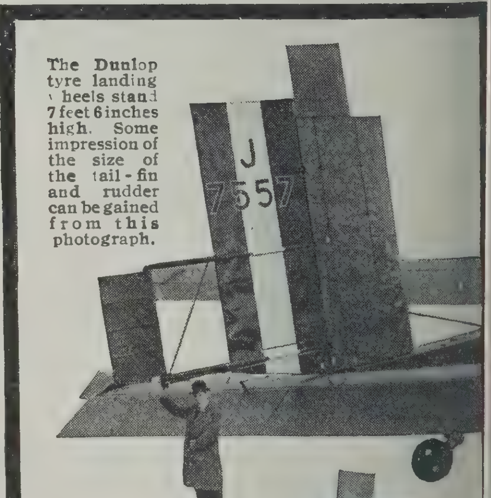
The Dunlop tyre landing wheels stand 7 feet 6 inches high. Some impression of the size of the tail-fin and rudder can be gained from this photograph.

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R.A.F. Photograph.
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The original scheme for the present Middle East service of Imperial Airways provided for a service from Cairo via Baghdad to Basrah and thence down the Persian coast to Karachi. A provisional agreement between the British and Persian Governments for the passage of British commercial aeroplanes over this latter section of the route was refused ratification by the Persian Medjlis, and the service has therefore not proceeded past Basrah.

Under the terms of an agreement recently made between the British and Persian Governments, the latter has signified its readiness to enter into negotiations with Imperial Airways with a view to overcoming this difficulty, and it is hoped that within a short period the Middle East route will be continued to the originally designed terminus, and that early next year Imperial Airways will be able to run right through from Croydon to India.

MR. VAN LEAR BLACK ABANDONS HIS TOUR.

Mr. Van Lear Black's projected flight to Cape Town has been abandoned in consequence of the discovery of defects in the Fokker F.VII-3m on arrival at Khartum. It seems that on the passage across the Mediterranean from Athens to Sollum on May 18 a very strong head wind was encountered, and at the same time one wing engine developed roughness of running. This became worse during the next day's journey to Khartum, and examination showed that the vibration had loosened a number of important fittings on the wing which could not properly be repaired with the resources available.

Mr. Black is returning to Marseilles by train and boat, and thence by air to Croydon, but he hopes at some future time to make the journey which he has just been forced to abandon.

AFRICAN AIRWAYS LTD.

On Apr. 24 a company known as African Airways Ltd. was registered in Pretoria. This company has been formed to operate an air service between Johannesburg and Durban under a subsidy of £8,000 per annum to be given by the Union Government.

The company has a capital of £50,000 of which £40,000 will be allocated to working costs and £10,000 to reserve.

The directors are Lieut.-Col. Sir Llewellyn Andersson, O.B.E., Sir George Albu, Bt., Mr. Robert Hayhoe, Mr. A. V. Lindbergh, and Mr. Reginald Parry. Two further directors will be nominated by the Government. Major A. M. Miller, D.S.O., O.B.E., M.L.A., who is responsible for fostering the scheme, will act as technical adviser and Mr. V. L. Andersson as secretary.

In addition to the Johannesburg—Durban passenger service the company intends to operate other lines between Durban and Maritzburg, Durban and Port St. Johns, and between other points of importance, to make special flights as opportunity may offer, to undertake photographic survey work, joy-riding, etc.

Under the subsidy agreement the Government undertakes :

(i) To pay the company a subsidy of £8,000 per annum for the first two years. After this period, the company's accounts shall be reviewed annually and if the company has made a net profit in excess of 10 per cent. of its paid-up capital the subsidy shall be reduced in proportion.

(ii) To collect a special fee at a prescribed rate over and above the ordinary postage on all postal articles despatched by air mail and will pay over to the company the total amount less 10 per cent.

(iii) To convey mails to and from the aerodromes free of charge to the company.

(iv) To advertise the air service free of charge in Post Office publications and date stamps.

(v) To provide an efficient meteorological service.

(vi) Not to negotiate during the period of the contract, or any extension or renewal thereof with any other company for the development of any other air routes in the Union without notifying the company of such negotiations or to give its sanction to any air service operating along the route covered by the present agreement.

(viii) To allow the importation free of charge or Customs duty of all aeroplanes, aero-engines, spares and accessories and undertakes to convey them over the Union railways at the lowest tariff rate, and, in addition, petrol, oil and stores, belonging to the company and intended for the purpose of the agreement.

It is estimated that the service between Johannesburg and Durban will occupy three to four hours, a saving of 17 hours on the present railway time. If passengers are landed at Newcastle, Dundee, Ladysmith, Pietermaritzburg, Standerton or Volksrust, an extra ten minutes will be added to the total time for each stop. Half-an-hour is allowed for the Durban—Maritzburg service, and an hour and a half for the week-end service between Durban and Port St. Johns.

It is projected that the company's fleet will comprise three D.H.61 eight-seater biplanes (450 Bristol Jupiter engines) and three D.H. Moths (A.D.C. Cirrus engines). The D.H.61s will be used on the main passenger routes and the D.H. Moths will be used for air-taxi and photographic work.

An extension of the service to Cape Town along the coast is contemplated at a later date under Government subsidy.

FLYING SCHOLARSHIPS.

Sir Charles Wakefield has given £300 to a Fund through which free training as pilots will be offered to persons, preferably women, unable to pay for their own training, who can convince a Selection Committee that free training will not be wasted on them. Four or five such " flying scholarships " will be awarded.

This fund, which owes its inception to Lady Heath, will be administered by the Air League of the British Empire.

PERSONAL NOTICES.

Forthcoming Marriages.

BENHAM—BACON.—The engagement is announced between Robert Benham, Flg. Off., R.A.F., son of Mr. and Mrs. Benham, of Leamington Spa, and Beatrice, daughter of Mr. and Mrs. Bacon, of Plumstead.

PEARSON—POTTER.—The marriage arranged between Mr. John Maclaren Pearson, late Cameronians and R.F.C., second son of the late Mr. C. J. B. Pearson and Mrs. Pearson, and Bettine Marie Hamilton, elder daughter of Major Cyril Potter and Mrs. Potter, of Blakes, Lymington, Hants, will take place at 2.15 p.m. on Saturday, at St. John's, Boldre. A reception will be held afterwards at Elmers Court, Lymington (lent by Mr. and Mrs. Herman Andreae).

SINCLAIR—JEWELL.—The engagement is announced of Flt. Lt. Findlay Willard Sinclair, D.F.C., R.A.F., youngest son of Mr. and Mrs. F. D. Sinclair, of Calgary, Alberta, Canada, and Miss Dora Jewell, only daughter of Mr. and Mrs. Washington Jewell, of Bulland, Hadley Grove, Barnet, and Wiveliscombe, Somerset.

Marriage.

GOLDIE—ALEXANDER.—On May 12, at Totnes, Flt. Lt. Archibald Harold Goldie, R.A.F., son of the late Archibald Watson Goldie and Mrs. E. M. Goldie, of Teddington, Middlesex, to Sylvia Mary Alexander, only daughter of Mr. and Mrs. J. J. Alexander, of Upton, Paignton.

Birth.

WATKINS.—On May 15, at Beechcroft, Anglesea Road, Alverstoke, Hants, to Jessie, wife of Sq. Ldr. S. R. Watkins, A.F.C., R.A.F.—a son.

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THE NEXT WAR

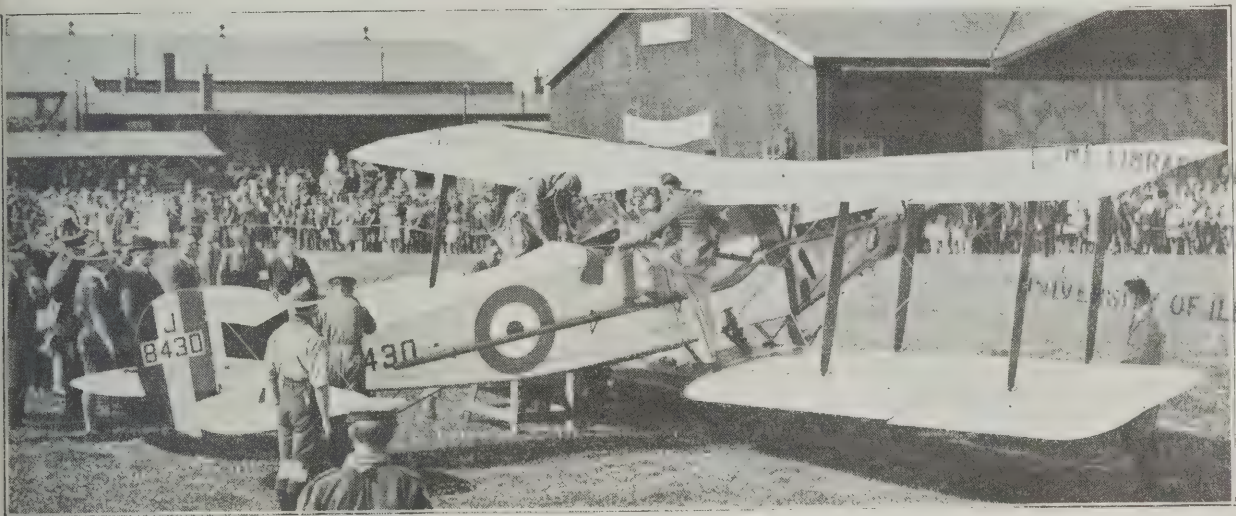
THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 23. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

"HE MAY NOT AS UNVALUED PERSONS DO,
CARVE FOR HIMSELF."—(SHAKSPEARE—*Hamlet.*)



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ROYAL COMMUNICATIONS:—H.R.H. the Prince of Wales, K.G., who is a Group Captain in the R.A.F., embarking in a Bristol Fighter of No. 24 (Communications) Squadron, R.A.F., at the Mousehold Aerodrome after his visit to Norwich and the Norfolk and Norwich Aero Club on May 30. The pilot of the machine is Flt. Lt. D. S. Don, R.A.F., and standing on the far side of the fuselage is Flt. Lt. F. O. Soden, D.F.C., R.A.F., who fitted His Royal Highness with a parachute which he wore in accordance with Service regulations.

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Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
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ON FURTHER CONSIDERATIONS OF THE NEXT WAR—III.

(Continued from page 722, May 23, 1928.)

A Russian Possibility.

There is always the possibility that, besides discovering its own particular Napoleon, Russia may also evolve an inspired producer of aircraft, who, besides selecting original and useful new designs, such as may be turned out by some of those half crazy geniuses which are so common in Russia, may also be able to organise Russian workmen and Russian workshops so that they can reproduce those designs on mass-production principles. A Russian Napoleon plus a really able Controller-General of Aircraft Production would be an ugly proposition to tackle in war, for, though the average Russian is a bad mechanic, there are plenty of hereditary horsemen in Russia to supply any quantity of pilots.

Nevertheless, leaving such a possibility out of the question, we are still up against the fact that the Russians already have enough aircraft of useful though obsolescent types to make themselves very unpleasant to the town-dwellers of any Central European nations which oppose the progress of the Red Army across Europe. There is practically nothing on the spot to prevent squadrons of Russian-built D.H.9as with Bolshevik engines (as they call the Russian-built Liberty) from bombing and gassing every city from Bucarest to Budapest and on to Vienna.

So far as the rest of those unfortunate countries is concerned, including the great corn-growing plains of Rumania and Hungary, and the forests of the Carpathians, the Red Army on the ground can attend very well to the conquest of such territory, for there is practically nothing to oppose its progress.

Therefore what concerns us particularly is to try and form some idea of what we are likely to be up against when at last we are dragged into the war, and what our ground and air forces can do against what we have to meet.

Enemy Ground Forces.

So far as can be seen, we shall have to operate against swarms, rather than masses, of cavalry, or, rather, mounted infantry—Cossacks, Turkomans, Kirghizes, or anything else in the way of horse-riding fighting men which the Russians can collect. There may be masses of infantry somewhere behind them, chiefly for use as garrisons of captured towns. Probably they will not come in direct contact with our troops, at any rate until the cavalry have been somehow wiped out.

The Russians are not likely to have very much in the way of artillery or mechanical weapons such as tanks. As has already been said, the Russian, of no matter what tribal origin, has little mechanical ability. Seemingly the descendants of Japhet inherit the blood of Jubal rather than of Tubal-Cain (*c.f.* T'bolcan or Vulcan).

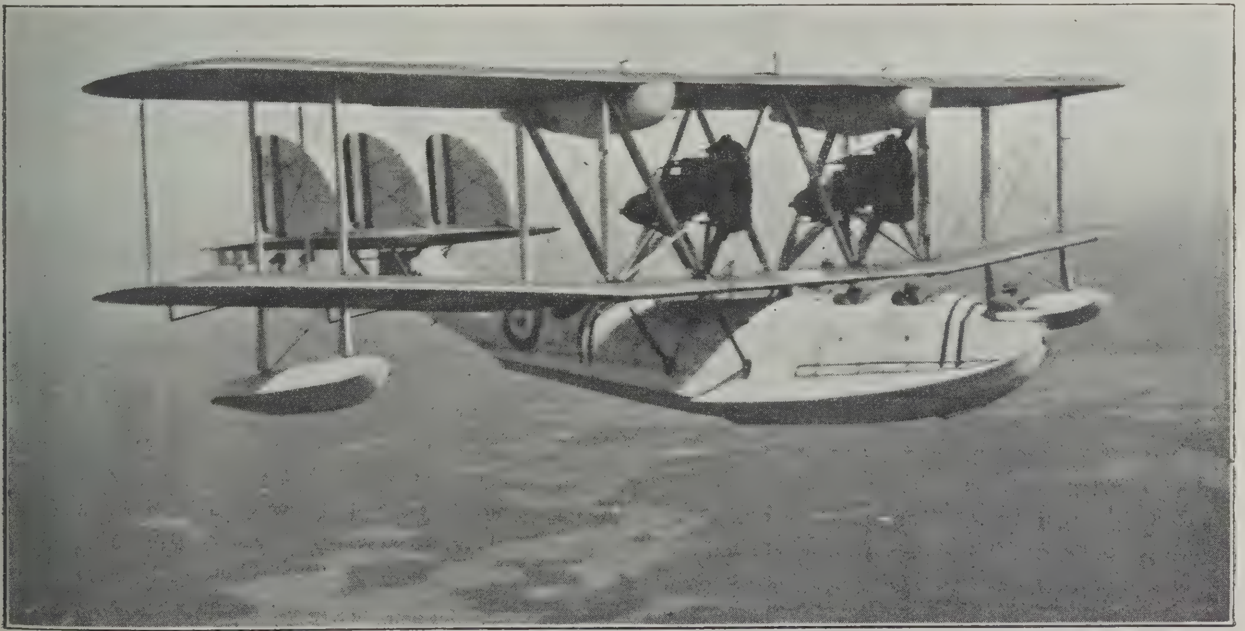
Apparently the belief of our mechanical warfare enthusiasts is that our tanks and light tanks and armoured cars and things will plough into these masses of Russian horsemen—who will promptly disappear over the Eastern horizon. The probability is that our clockwork contrivances will plough their way through the hostile forces right enough, but that the hostile forces, being in such vast numbers, will simply close up behind them and hang around out of range till our mechanical warriors have exhausted their petrol and ammunition, and that then the cavalry will merely trot in and finish them—as in the old days mere churls with knives and cudgels went in and finished unhorsed knights in armour.

As Kipling wrote of the Mounted Infantry in South Africa, "Our words of command are Scatter, and Close, and Let your wounded lie." And so long as horsemen scatter and close quickly enough, and do not mind a reasonable amount of loss, tanks and armoured cars cannot do very much with them. Also, there are such things as decoys and tank-traps.

Moreover, the range of mechanised forces on the ground is limited. When loaded down with ammunition and supplies they are tied to something like a hundred-mile journey from their line of supply, whether that line be a railway or a road.

No nation on earth is likely to be able to set going a complete cordon of tanks and armoured cars right across the Central European Plain. So we cannot hope to make a jack-rabbit sweep of the Russian forces. And so there will always be enemy forces behind and between our mechanised forces, as well as in front.

The net result will be that we shall probably find ourselves after a month or two of war screaming for cavalry. We shall import tens of thousands of bad-tempered, narrow-chested,



THE FAR EAST FLIGHT.—Two Supermarine Southamptons (450 h.p. Napier Lion engines) of the Far East Flight over the land between Akyab and Rangoon. (Puzzle :—Find the second.)

herring-gutted horses from the Argentine, as we did in South Africa. We shall enlist, as we did then, thousands of sporting young Englishmen and give them "Three days to learn equitation and three months of blooming well trot." And thus we shall try to tackle hundreds of thousands of square-heads who were born and bred in the saddle. Those who remember the fate of the Imperial Yeomanry and the City Imperial Volunteers in South Africa will sympathise with the volunteers of the future.

MECHANISED AND SAVAGE ARMIES.

A British officer who has given considerable thought to this same problem propounded the other day a delightful theory to the effect that what we really need is two distinct armies, one a Mechanical Army, mechanised to the very highest degree, for special work over country and from bases particularly suitable to the limited range of mechanised forces, and the other a Savage Army, consisting entirely of mounted infantry with the lightest possible equipment, and trained to live on the country like locusts as they pass through it. He added, by way of a compliment, that he would use Australian and Canadian troops as savages whenever he could get them.

His Mechanical Army would be used only in open country within range of areas which had to be defended. His Savage Army would tackle the hilly and wooded and broken country where tanks could not operate. And it would penetrate to regions far beyond those which the limitations of supply lines would permit to the mechanised people.

There is much to be said for this idea, and one commends it heartily to those not only in this country but in Germany and in France and in Italy who will have to tackle the Red Army. The only trouble is that no Western European Power is in the least likely to set about organising and training its Savage Army till the war is well under way and much of its mechanised forces have been sunk without trace by the Tartar Hordes.

Having now got an idea—possibly quite erroneous—of what is likely to happen on the ground, we may proceed to consider what sort of aircraft are likely to be wanted.

WANTED, A SCOUT.

Obviously the first thing you want in a war is to know what your enemy is doing and what he is going to do. In the earliest days of aircraft we talked about the value of "seeing behind the hill" and of "dispersing the fog of war." Consequently the first requirement of a fighting force on the ground is air scouts. Quite a good argument could be put up for the statement that, given adequate air scouting, a properly organised army on the ground can do without any other air force.

Now, if we are going to fight an enemy composed of hordes of light cavalry sprinkled all over the Central Plains of Europe, and scattering, and if possible hiding, at the approach of every aeroplane, not very much good is going to be done by short-range scouting. We cannot dig a trench line from the Baltic at Danzig to the Adriatic at Fiume and present an impenetrable front to the enemy, as the Germans did between the beginning of 1915 and the middle of 1918. The best we can do is to oppose to those mounted hordes a blocking force of mechanical fighting machines and detachments of our Savage Troops on whatever line of advance they seem to be making.

The only way to find out that line of advance with anything like accuracy is to discover the direction taken by the various detachments from their main concentration points, wherever those may be, whether a railhead or a port or a river or simply an assembly point at some city in the plain itself.

To be out of reach of assault by any tanks or armoured cars which might conceivably be able to travel for considerable periods without breakdown, and also to be out of the way of such types of heavy bombing machines as exist to-day, these concentration points are obviously going to be two hundred miles or more behind the actual fighting belt.

One uses the phrase "fighting belt" because in a war such as this, with an absolutely fluid front, there is not going to be any such thing as a fighting line. The actual field of battle is more likely to be a belt of country which may surge backwards or forwards a hundred miles in a day with the success of attack and counter-attack. That belt may have a plan view like that of a serpent, as flanks are left in the air by the advance or retreat of one army or the other.

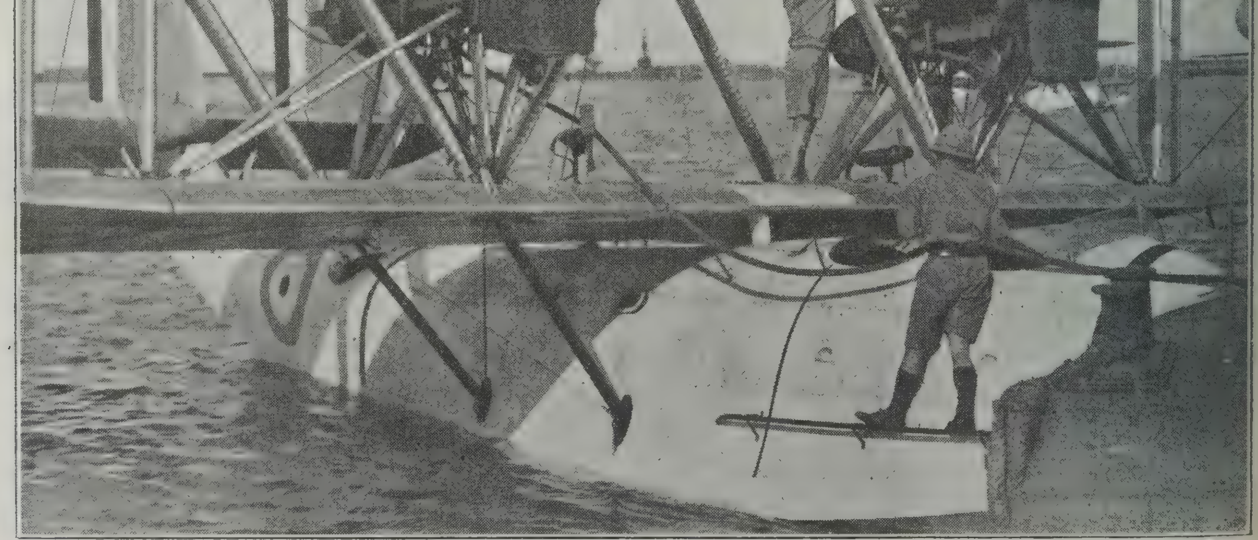
Which, of course, means that almost everything we learned in the way of tactics in the war 1914-18 will be useless for horse, foot, guns and aircraft alike.

Given that we want to know the enemy's lines of advance and that those lines can only be discovered in country which is between a hundred and fifty and two hundred miles away from our own comparatively safe areas, then the first thing we need is a real scouting aeroplane.

THE REAL SCOUT.

What we want is something very like a Schneider Trophy winner carrying an automatic camera. Such a machine would leave its own aerodrome, traverse two hundred miles, take such photographs as seemed good to the pilot on the way out and back, and be home again within two hours.

As we already have fighters, though not yet as squadron equipment, which exceed 200 miles an hour, obviously this scout machine must have a speed of considerably over 200 miles an hour. It might possibly carry twin machine-guns, but it would be better if it carried no armament at all and



THE FAR EAST FLIGHT.—Re-fuelling at Karachi. The large area tropical radiators and the Leitner-Watts detachable-bladed metal airscrews are noticeable.

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without trouble or mishap.

Four Royal Air Force Supermarine "Southampton" flying boats, each fitted with two Napier engines, have reached Australia from England.

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depended entirely on its speed for its safety,—then even the bravest pilot would have to run instead of wasting time fighting.

The camera would not only have to be automatic in action, but it would have to have an automatic developing apparatus integral with it, so that when the pilot landed the photographs would be all ready for inspection by the Staff,—something like the Photomaton, with its "eight for a shilling."

There is no doubt about the need for such a machine. There is no difficulty about the production of such a machine. But no nation happens to have one.

Even for short-range reconnaissance such a machine would be useful. For an aeroplane which can go fifty miles out and be home again with photographs in half-an-hour is quite a useful thing to have about the Military house.

Stopping the Mass-Advance.

Having found the enemy's concentration points, and having found the general lines of his advance from those points, the next thing to do is to hinder his advance as much as possible and to put as many of his troops out of action as can be done by aircraft.

The assumption is that, for some considerable distance at any rate, his troops will move in masses, in columns along roads. Therefore our object is to catch those masses before they break up into small bodies which can scatter and close easily. According to the ideas acquired in the late lamented war, the proper way to do this is to find the enemy's troops on the road and bomb them.

Certainly bombing has a demoralising effect on troops. Infantry who will stand hammering in trenches by the most intense shell-fire are apt to become distinctly jumpy when bombed. Probably the psychology of this is that shells come from one direction only, whereas bombs drop all anyhow.

As a matter of fact, bombing in the open is rather a futile form of warfare. It may be effective against houses where the falling walls do more damage than the actual bombs. And Hill tribes and Desert tribes, who regard war as their own particular form of sport, can be influenced by bombing, because the bombs destroy their homes and make them personally uncomfortable. But bombing is much less likely to be effective against trained troops advancing through enemy country. They have no personal interest in the destruction of the particular buildings which they happen to be occupying when the bombing begins. And so long as they get out in time they are left cold by the destruction.

Therefore probably the best form of air attack on an army invading Central Europe is either gas or machine-gun attack.

Gas Bombing.

Just how much damage gas bombs from the air can do is probably a question which has still to be answered by practical experience. Mr. Haldane, in that educative and amusing little booklet entitled *Callinicus,* gives a very fair idea of what gas attacks could do five or six years ago. But he dealt almost entirely with gas attacks on and from the ground.

Certainly at that particular time gas-bombing from the air was hardly worth while. So far as one could learn then, no gas which was useful for Military purposes could be concentrated in bomb-cases in quantities big enough to make the carrying of it worth while.

During the big German Push in 1918 thousands of tons of gas-shells had to be pumped into a little place like Armentières before it became uninhabitable. Probable all the aircraft of all the belligerents would have been kept busy for a week in an effort to produce a similar effect.

Since that time we have produced gases which are much more deadly, and can be compressed into a smaller container. And possibly high-speed long-range bombers with gas-bombs, if skilfully handled, could be used with good effect in breaking up enemy columns on the march. But, unless there happened to be a fairly strong wind, troops, especially light cavalry, could probably get out of the way of gas quicker than the gas was likely to travel.

There is always a possibility that somebody may produce a gas which can be ejected from an aeroplane very much as a smoke-screen is ejected. A line of gas dropped in that way to windward of a column would certainly have a deadly effect. But, so far as one's admittedly small knowledge of gas warfare goes, no gas exists which can be dropped in that way, or, if it can be so dropped, can be carried in an aeroplane in big enough quantities to be effective.

Even if it did, mobile troops could probably travel faster over the ground than could the gas.

No doubt a certain amount of damage could be done to enemy troops by gas-attacks from the air, but there is no more possibility of gassing the whole of the plains of Central Europe than there is of forming a cordon of tanks from the Baltic to the Adriatic.

To be really effective we need something far more direct in its visible effect than either gas-bombing or gas-squirting. The homely bullet will still probably prove to be the most effective man-stopper.

Consequently, although we may conceivably need, and therefore produce, a gas-attack machine which will operate something like those of the advertising sky-writers, we shall also need an aeroplane, which, with comparative safety to itself, will hose bullets out of its machine-guns at close range, both for attacking columns in the back areas and for attacking scattered cavalry in the Battle Belt.

As a matter of fact, a somewhat similar type of machine would be needed also for gas-bombing or gas-squirting. In either case, to be thoroughly effective, the machine would have to fly quite close to the ground, just as our trench-strafers did in the War 1914-18.

The Salamander Type.

Towards the end of 1918 the Sopwith Aviation Company brought out a machine called the Salamander, so called because it was intended to be impervious to enemy fire. This was armoured underneath to protect the engine, tanks and pilot against fire from machine-guns or rifles on the ground.

If one recollects rightly, the machine had a rotary engine and therefore the engine could not be conveniently armoured. Also the engines of those days were much less powerful, and armoured plate was much less developed than it is to-day, and metal construction was not developed at all.

In those days we tried to put bullet-proof plating on a wooden aeroplane. To-day the bullet-proof plating could form part of the actual necessary structure of the machine. Consequently a machine of the Salamander type will be much easier to make and much lighter to-day than it was in 1918.

In the intervening ten years people have talked about armoured aeroplanes, but, as so often happens, the enthusiasts have gone too far. They have wanted to make an aeroplane which would be bullet-proof, not only below but above and all round. Consequently all projected designs for armoured aeroplanes have worked out a good deal too heavy.

Armoured Attackers.

There is, in fact, no reason why an aeroplane for ground-strafing need be armoured all over. If it carries enough armour to protect most of the engine and the petrol tanks and the pilot, that is quite good enough.

The idea of producing a 100%-safe armoured aeroplane is just as silly as was the idea which prevailed in 1917-18 that parachutes should not be issued to our aviators because they were not 100% efficient. It never seems to have occurred to the technical people of that period that if parachutes were only 50% efficient they would, at any rate, save half the lives which we lost through people being shot down out of control or jumping out of their machines when they caught fire, or being burned to death by staying in their machines.

If our pilots and gunners had known that if their machines were set on fire in the air they would have one chance in two of getting down alive, they would have been very much happier than they were. We should have got a lot more work out of them because they would not have suffered so badly from nerve strain. And a good many hundreds of lives would have been saved by the existence of a 50%-safe parachute. But the fool technical people kept on trying for a 100%-safe parachute with the result that nobody ever had any parachutes at all.

Coming Down To It.

Recent experiences against the Akhwan in Nejd and 'Iraq have shown that scattered men on the ground have actually a distinct advantage over aircraft,—especially against aircraft with water-cooled engine and out-size tropical radiators.

In these attacks, although anything under three thousand feet is unsafe, the R.A.F. do come right down to it. Hence the number of machines that have been shot down, as related in a recent article in this paper. If a man on the ground has the pluck to stand up to a machine which is coming straight at him, he may be missed by the machine-guns of the aeroplane, but he must be a pretty bad shot if he misses its radiator.

There ought to be very little difficulty in armouring the front of a radial engine, with only its cylinder heads sticking out of the armour. And it ought to be quite easy to armour the fuselage half-way up as far back as the pilot's seat. There is no need even for the armour to be bullet-proof at point-blank range. The chances are that most of the bullets would hit it at an angle and be deflected.

Armoured even at that extent it would probably provide something like 75% of safety against being brought down by rifle fire or machine-gun fire from the ground, as compared with the chances of an unarmoured machine of present day types.

So here again we have another class of machine which is wanted and does not exist.

Ground Attack.

The precise type of machine may be open to discussion. It may be a single-seater with a couple of guns firing

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forward, or it may be a two-seater with a gun aft. There is much to be said for either type. But the one thing certain about it is that its speed must be more than 200 miles per hour. Otherwise it is going to take too long to get to its job and home again.

Late in 1918 the Junkers Company produced a special trench-strafing machine, which had, if one remembers rightly, armour along the bottom and sixteen machine-guns sticking through the floor, eight of them firing at an angle forward and eight of them firing at an angle backwards. Something similar was also produced in America. Neither was ever used in the War.

Purely for trench-strafing against fixed positions a machine of that type might be all right. The machine would start from an advanced aerodrome near the fighting line and would merely have to pump lead into the trenches as it went along without bothering about aiming at anybody in particular. But that kind of thing would be no use against scattered horsemen in the open.

For such work the man in the aeroplane has got to be a deadly shot against a small target. He can only carry a certain amount of ammunition and he may have to go anywhere between a hundred and two hundred miles home for fresh supplies. Therefore he cannot career around using his machine-gun as a hose. He has got to treat each individual on the ground to one short burst of fire and either get him or go on to the next. There is no use in filling the Plains of Europe with lead.

Which suggests that the targets used for practice in future warfare of this kind will have to be very different from those which are in use to-day. They must be upright targets, scattered over a large area, and not merely aeroplane silhouettes floating on a pond, as in the bad old days.

Also, designers will do well to remember that for a job of this kind, although the machines will have to be very fast in order to reach their objective, and get home again, they must be capable of flying very slowly when they get there, so as to give the pilot, and the aft-gunner, if any, a fair chance of getting his man. Which suggests not merely slot-control for ailerons, but slots all along the leading edge.

LANDING GROUNDS.

Another consideration which suggests itself in preparation for warfare of this kind is that there will be no chance of preparing advanced landing-grounds close up to the firing-line, with the intention of using those advanced landing-grounds for months on end as we did in France. Consequently, these fast machines will have to be able to get off at a very low speed and land at a very low speed. Which again suggests further developments of the slot arrangement.

Furthermore, as there will be no time at all in which to prepare aerodromes anywhere near the fighting belt, we shall do well to consider the possibility of launching the machines from catapults. Some clever engineer ought to be able to devise a portable catapult which would take up very little more room on a road than the standard type fire-escape.

If the machines could be shot off a catapult they ought, with slots, to be able to land on any clear patch about the size of a football ground.

EXISTING AIRCRAFT.

As for the other types of aeroplanes which we shall need, we seem to be working fairly well in the right direction as it is. Our high-speed day-bombers, with their speeds pushed up to somewhere about 170 to 180 miles an hour, as can be done easily with specially-geared engines like the Napiers which are used in the Hound and the special III.F, ought to do very well for such work as breaking bridges on the enemy's line of advance, or retreat, and for bombing towns or villages which are known to be occupied by enemy troops.

We call this class of machine a day-bomber, but as a matter of fact there is no earthly reason why it should not be used equally for night bombing. With slots it can certainly be made to land as lowly as any other machine.

Our latest types of single-seat fighters are now putting up speeds which would justify us in calling them pursuit-ships, after the American fashion. They ought to be quite good enough to catch and destroy any bombers or ground-attack aircraft which any other Nation can put up against them.

But, if we are going to use them as pursuit-ships, let us avoid cluttering them up with wireless and bombs and all kinds of other gadgets as we do with our unfortunate single-seat fighters at present.

If we are going to use a particular class of machine for a particular class of job, let us equip it for that job instead of loading it down with a heap of fittings which we intend for some other job. Nobody expects a gun-limber to be an ammunition waggon and a general-service waggon and an ambulance waggon all at once.

STANDARDISATION AND ITS DANGERS.

One of the greatest dangers to be avoided in preparing the Air Force for the Next War is the quite natural Service passion for standardisation. Obviously from the Service point of view it is desirable that every squadron of each distinct class should be equipped with precisely similar aircraft. There should be only one type of scout machine. There should be only one type of single-seat fighter, or at most two, one for altitude and one for high-speed fighting There should be only one type of high-speed bomber, for day and night work. There should be only one type of ground fighter. There should be only one type of army co-operation machine and there should be only one type of general purpose machine. In fact, the general purpose machine might very well be the same as the high-speed bomber.

But we ought now to profit by the lesson of the War 1914-18 when the attempt to standardise the B.E.2C merely ruined the *moral* of the R.F.C. in 1915-16. And to-day we seem to be creeping back to the same system of standardisation, by which one type of aeroplane is adopted for a certain class of work and all competitive types are turned down.

In a praiseworthy desire to keep the approved firms of the Aircraft Industry in existence, those firms whose own designs have not been approved for a certain class of aeroplane are told off to build aeroplanes of that class to the designs of the producer of the successful type. Thus the Air Ministry hopes by keeping all factories at work, if not actually busy, to enable each firm to maintain its design staff in the hope of being more successful with another type.

The drawback to this system is that production machines are not always the same as the original machine of the type which went through its official tests and caused that type to be adopted. The sample machine may put up an excellent performance and be approved by technicians and pilots alike. But, after it has been adopted, technicians at the Air Ministry or even in the maker's factory, may introduce alterations of their own with the result that the production machines when built may be horrible aeroplanes to fly.

SQUADRON STANDARDISATION.

A far better scheme would be, whenever a new class of aeroplane is needed, to adopt two or three different types in that class and equip different squadrons with them. For example, there are twelve fighter squadrons. We might well select the three best fighter types and equip four squadrons with each type, instead of equipping all twelve squadrons with one type, as seems to be the desire, and leaving out two types which might quite conceivably, when put into production and handed over to squadrons, actually be better liked by the pilots and easier to maintain in the workshops than the type which won the order for that class.

Certain firms might be unlucky for years on end and never have their types adopted, and those particular firms should be turned on to produce one or other of the approved types. But when, as does happen and has happened in the General Purposes Competition and in the Fighter Competition, two or three machines are so nearly equally good that a choice between them is almost impossible, each of those machines which are so nearly as good as the winner ought to be put into production simply because the production machines of the second prize type might actually come out better under Service conditions than those of the first prize type.

The result would be that by the time the war began we might have had enough experience of the different types to know for certain which of them should be put into mass production by non-aircraft-manufacturing firms, for use in the field.

Without being specific about any one type or class of machine, one can say that experience in the past eight years, since the rebuilding of the Air Force began after the War, has provided instances in which machines which have been put into production as standard types have been markedly inferior, either in performance or in flying ability or in actual strength of construction to other machines which have been turned down. And the result has been that the Air Ministry has been compelled to order over and over again types in the same class which the new types were intended to replace.

FOOD FOR THOUGHT.

These are only a few suggestions for the consideration of those who will probably have to fight in the next war. Some of them may seem ridiculous, but there is nothing in any of them which is impracticable. One offers them for what they are worth, to the consideration of the Royal Air Force all the way from the High Authorities at the Air Ministry to the latest-joined cadet at Cranwell or apprentice at Halton.

The great thing to remember is that in preparing for the Next War everybody ought to remember, or learn, as much as possible about the Last War. Having done so, he ought to review that knowledge carefully with the idea of discovering how much of it must obviously be useless in the Next War and ought, therefore, to be forgotten.—C. G. G.

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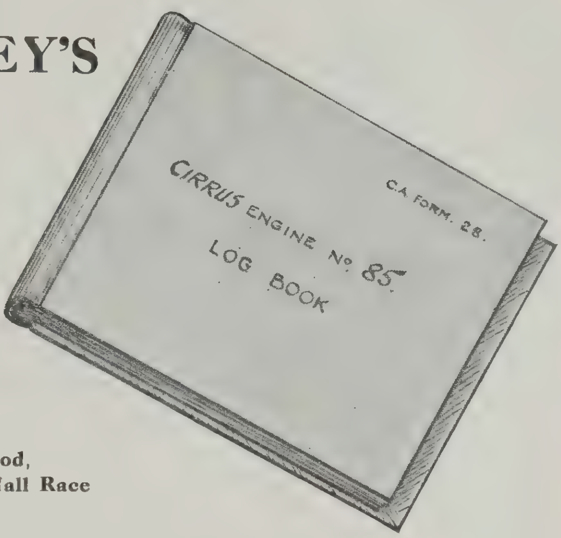

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SIR ALAN AND LADY COBHAM'S RETURN.

All those who are able to appreciate valuable work well done will rejoice at the return to England of Sir Alan and Lady Cobham after their great flight to and round Africa. Though this flight has not been so spectacular as many of his previous performances, it has undoubtedly been of immense value. Despite the unfortunate mishap at Malta on the outward journey and the long delay on the West coast of Africa on the return journey, owing to radiator trouble, Sir Alan has done great work in demonstrating the possibilities of seaplanes.

Such mishaps as he experienced might well happen on organised air lines, but in such cases they would only cause brief delays, as the service would be maintained by spare aircraft. Consequently he has definitely proved that air lines using flying-boats can reasonably be maintained through and round the African Continent. Particularly he has shown that the flying-boat is the right vehicle for the service up the Nile and over the Great Lakes where in fact an air service can be of the very highest value to our great Colonies in Central and East Africa.

The whole performance emphasises the value of Sir Alan as our foremost commercial aviator. Whatever he does in the way of flying is done with a definite commercial end in view, not for his own personal gain, but for the development of Commercial Aviation. One hopes most sincerely that the enormous amount of work which he has done in this cause, and particularly all his efforts during this voyage to link up air lines from South Africa to the North will bring him in the end the prosperity which he so thoroughly deserves.

One would like to add a word of admiration for Lady Cobham, for the gallant way in which she has been through all the atmospheric and climatic difficulties of this great voyage. Of all the English women who have interested themselves in aviation, none has shown greater confidence in the present and future of aircraft than has Lady Cobham. Not being a pilot herself she has not even had the excitement of driving the machine as an incentive to put up with the hardships of the flight, and so her pluck and perseverance in going right through the journey is the more admirable. This being an age of records, she can, at any rate, claim that her 20,000-mile journey is the longest yet made by any woman in the air.

Praise is also due to Capt. H. V. Worrall, the second pilot of the machine, who, with Sir Alan divides the credit for the skill and judgment which has brought the big boat through unharmed except for circumstances which no human element in the machine itself could have defeated. And with him must be joined Messrs. Green and Conway, and the kinematograph man, Mr. S. R. Bonnett, who have shared the pleasures and perils of all this notable journey.—C. G. G.

On May 31 Sir Alan Cobham arrived at Plymouth on the conclusion of his 20,000-mile flight round Africa on the Short Singapore (two 650 h.p. Rolls-Royce Condor engines). He had left Bordeaux at 06.30 hrs and was due to arrive at Plymouth soon after noon but on reaching the French coast the Channel was completely blanketed by fog. After flying up and down the coast for an hour and a half trying to find a way through he decided to wait for better conditions. An alighting was made on a small river near Point du Château and a telegram was sent to Plymouth stating that the Singapore was fog-bound.

At 15.30 hrs. the weather had cleared sufficiently to allow of a resumption and after making a *détour* by way of Guernsey, Plymouth was reached at 17.20 hours. After circling the harbour three times the Singapore alighted off Cattewater Air Station. Here Customs and other formalities were complied with and it was not until after 19.00 hrs. that Sir Alan and his party crossed the harbour to the Mayflower Steps at the Barbican to be welcomed by Councillor and Mrs. W. H. Priest, the Mayor and Mayoress of Plymouth; Sir Sefton Brancker, Director of Civil Aviation, and other notabilities.

On June 1 Sir Alan left Plymouth with the intention of flying to Rochester by way of London for the purpose of handing the Singapore over to its makers for an overhaul prior to starting on a tour of Great Britain. When over Bournemouth a tear was noticed in the fabric of one of the wings and as there was still a considerable distance to cover overland it was decided to alight at Calshot. A general overhaul was made at Calshot instead of making a temporary repair there and continuing to Rochester. On June 4 he flew from Calshot to Rochester. The itinerary of the tour will be as follows: Rochester—Hull—Newcastle—Edinburgh—Glasgow — Belfast — Liverpool — Cardiff — Southampton—London—Rochester. He was due to leave for Hull on June 5.

The Sir Charles Wakefield Flight of Survey round Africa began on Nov. 17, 1927, when Sir Alan Cobham left Rochester on the Short Singapore all-metal flying-boat (two 650 h.p. Rolls-Royce Condor engines). This flight, like many others whose object was the development of Empire communications, has been generously supported by Sir Charles Wakefield, who once again has seen such a flight brought to a successful conclusion by Sir Alan Cobham.

Accompanying Sir Alan, was Lady Cobham, who throughout the flight has acted as her husband's secretary, Capt. H. V. Worrall, D.S.C. (assistant pilot), Messrs. F. Green and C. S. Conway (engineers), and Mr. S. R. Bonnett (cinematographer).

The total distance covered was approximately 23,000 miles of which the odd 3,000 miles were flown by Sir Alan in a D.H. Moth in Kenya, Northern and Southern Rhodesia.

Of the work accomplished and the results achieved by the flight, the following are the most important.

THE RETURN OF THE WANDERERS.—From left to right: Capt. H. V. Worrall, D.S.C., Sir Alan Cobham, K.B.E., A.F.C., Lady Cobham, Mr. S. R. Bonnett (cinematographer), and Messrs. C. S. Conway and F. Green (engineers).

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3 years world-wide service

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treets.

Between Alexandria and Mwanza (Tanganyika) the final survey of the country between these two places, which will form the first section of the through air route to Cape Town, was completed.

Between Khartum and Mwanza Sir Alan Cobham completed the scheduled number of experimental flights between these two places as called for by the Colonial Office, covering a distance of 2,770 miles in four days. This was arranged by Cobham-Blackburn Air Lines Ltd., the new company formed to carry on work done in Africa by the North Sea Aerial and General Transport Ltd., Sir Alan Cobham and Capt. T. A. Gladstone during the last three years.

At Nairobi Sir Alan attended the East African Governor's Conference, at which support in a practical form for a proposed air service from Alexandria to East Africa was promised.

In Nyasaland, Northern and Southern Rhodesia, similar support was promised by the Governments with whom Sir Alan Cobham discussed his schemes.

In South Africa interest in the through air route from Cairo to Cape Town was stimulated afresh particularly with regard to the possible transport of gold from Johannesburg to London and the East.

An entirely new air route was prospected from Cape Town to Nigeria up the West coast of Africa.

Inquiry was made with the co-operation of the Governments concerned for utilising aircraft to develop Nigeria, the Gold Coast, Sierra Leone and Gambia.

With regard to the outward journey to the Cape, Sir Alan has been successful in securing the support of the various Colonies for the future establishment of a through air line from Cairo to the Cape, but on the homeward journey he was rather breaking new ground and time alone will show to what extent aircraft will be allowed to assist in the development of the British West African possessions.

The opening of a Cairo—Cape Town air service has been brought much nearer by this latest expedition and final plans and estimates are now being prepared for submission to the British Government.

Such a route will naturally be operated by a series of short routes interconnecting with one another. Observation has shown that the line of white settlements rather than the most direct air route must be followed.

So far it is expected that the first section from Alexandria or Cairo to Kisumu will be operated by flying-boats down the Nile and the Central African lakes. At Kisumu the route will deviate and thence aeroplanes will be used to connect Nairobi, Arusha, Iringa, Mzimba, Fort Jameson, Blantyre and Salisbury, with probably a branch line to Broken Hill.

With regard to the operation of aircraft under African conditions a complete report has been prepared on the behaviour of the machine, engines and equipment under tropical conditions and in addition a report with charts of nearly fifty flying-boat harbours and anchorages in Africa, with notes on weather conditions encountered en route, has been drawn up for the future use of aircraft operators.

Finally by arrangement with the Gaumont Company a complete cinematograph film has been taken which, apart from its use as an illustration to the reports of the expedition, should form a vivid record of conditions and events en route for the edification of the general public as to the widespread ramifications of the British Empire.

ACROSS THE PACIFIC.

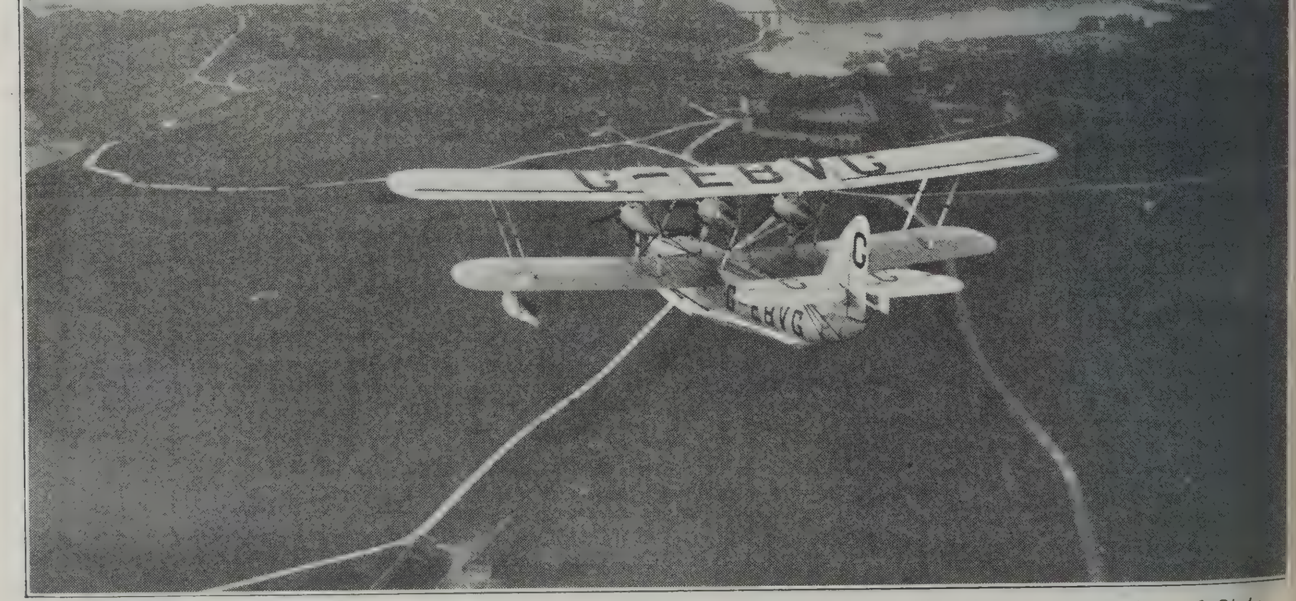
At 09.00 hrs. on May 31 Capt. Kingsford-Smith and Mr. Ulm (pilots), both Australians; Lieut. Lyon (navigator), and Mr. Warner (wireless operator), both Americans, left Oakland, Cal., in a Fokker F.VII-3m (three Wright Whirlwind engines) to fly to Australia by way of Honolulu and the Fiji Islands.

At 12.15 hrs. on June 1 they landed at Wheeler Field, Honolulu, after covering the first leg of their flight, a distance of 2,400 miles, in 27 hrs. 27 mins. The machine, known as "The Southern Cross," was in wireless communication with land stations throughout practically the whole distance, but two hours before landing the receiving apparatus broke down.

At 05.20 hrs. on June 3 they left Barking Sands, on the island of Kauai, 100 miles from Honolulu, for Suva, Fij Islands.

At 14.20 hrs. (02.20 hrs. G.M.T.) Capt. Kingsford Smit landed at Suva, Fiji, after having covered a total distance o 3,200 miles from Honolulu in $34\frac{1}{2}$ hours, the longest overse flight ever made.

The machine was in constant wireless communication wit land, and conditions were such that all the messages fro the "Southern Cross" which were relayed by the Sydne broadcast station were heard by all listeners with such dis tinctness that occasionally the roar of the three engine could be noted above the ticking of the Morse messages.



A MINISTERIAL HOLIDAY.—The Short Calcutta (3 Bristol Jupiter engines) in which the Secretary of State for Air, accompanied by the Lady Maud Hoare, Air Vice-Marshal Sir John Higgins and others, made a cruise of the Channel Islands and the Scilly Islands during the Whitsun holidays.

Even beyond the dreams of Jules Verne

The 'SHORT' "SINGAPORE"
ALL-METAL FLYING BOAT
commanded by
SIR ALAN COBHAM K.B.E.
has completed a survey flight of
20,000 MILES
around the African Continent

The 'Singapore' is of 'SHORT' all metal construction and equipped with twin Rolls-Royce Condor engines.

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THE FINISH OF THE KING'S CUP RACE.

One of the most difficult problems confronting the Royal Aero Club as organisers of the King's Cup Race is the fact that no matter how good the handicapping may be, there is practically no possibility of inducing anything like a crowd to come and see the finish of what is in fact the greatest British flying event of the year,—and therefore ought to be the most exciting.

A fair crowd will always go to see the start because there are many machines on the ground and there is interest in seeing how each pilot gets away. But the finish is a spread-out business with nothing to make it exciting for more than a few seconds. Trick-flying and so forth is not enough in itself to keep a crowd keenly interested, quite apart from the fact that after the winner has finished, there may be a dull wait for the second and third machines.

A suggestion has been made, which strikes one as being singularly helpful, that instead of finishing the race at Hendon, whence it will start, the finish should be at Brooklands, where on that day, July 21, the Brooklands Automobile Racing Club are holding a 200 mile car race. That will mean that there will be an enormous crowd at Brooklands in any case, and by having the finish of the King's Cup Air Race there, all these thousands of people will be led to take at any rate a temporary interest in the air race.

This interest can be made to have a permanent value in creating airmindedness among all these thousands if the work be done properly. There are three essential things to be done. One is to arrange a good system of broadcasting to let the crowd know when the machines are expected to finish and which machines are expected in which order. Another is to put into the Brookland's programme a slip containing a well and simply written article on the race and the machines and the pilots concerned in it, explaining how it is that big and little machines are all competing at once. And the third is to work up with the assistance of the aeronautical correspondents of the Press, who would, one is sure, do it whole-heartedly, an interest in this novel idea of finishing the race at a big motor meeting.

Yet another thing is to have good notice-boards showing the positions of the machines from time to time.

One desires rather to emphasise the idea of telling the story of the air race in a slip separate from the Brooklands programme itself, because the complete separation of the two will have a definite psychological effect, by concentrating the attention of the readers on the air race itself.

One commends this suggestion to the Racing Committee of the Royal Aero Club for serious consideration. If the Committee of the Brooklands Automobile Racing Club are favourable to this suggestion, as one believes they are likely to be, seeing that Brooklands was the first public aerodrome on anything like a big scale, and is still the only proprietary aerodrome which is equipped to handle both aircraft and a big crowd at an air race meeting, the arrangement would have advantages all round. The Royal Aero Club might not make any money out of it, but it would, at any rate, save the Club the expense of organising a finish at Hendon.

On the one hand, all the people who would be interested enough in air racing to go to Hendon to see the finish of the race would go to Brooklands on that day and would so increase the gate, and a still larger number of people who are moderately interested in air racing and in motor racing would go to Brooklands to see the double event though they might not go there or to Hendon with one attraction.—C. G. G.

THE MIDLAND AERO CLUB'S MEETING.

Those who want to see good flying should remember that the Midland Aero Club's "Pageant" takes place at Castle Bromwich Aerodrome on Saturday next, June 9.

This is one of the approved Meetings supported by the Royal Air Force. There will be evolutions by four Gloster Gamecocks led by Sq. Ldr. C. N. Lowe, M.C., D.F.C.; an Aerobatic Display by Flt. Lt. A. C. Collier; a Ground Strafe by the aforementioned Gamecocks; the bombing of a Derelict Fort; and a demonstration of advanced dual instruction by Flt. Lt. Cox, M.C., A.F.C., Adjutant of No. 605 County of Warwick (Bombing) Squadron.

Civilian demonstrations will include an Exhibition of Inverted Flying by Mr. E. G. Lowdell, of the Suffolk Club, on a Blackburn Bluebird; a Display of Aerobatics by Mr. Neville Stack on a Moth; a Display by Mr. C. A. Brown, chief test pilot for A. V. Roe and Co., on an Avro Avian; a Demonstration of Speed by Flt. Lt. Luxmoore on the Avro Avenger; a Display of the Slotted Wing by Mr. Hubert Broad on a Moth, and also a Display of the Westland Widgeon by Mr. Louis Paget. A Parachute Descent is also probable.

The Sporting Events include the race for the Air League Challenge Cup over a 24-mile course; the race for the Midland Inter-Club Challenge Cup, for *ab initio* pilots of affiliated Clubs; the race for the Midland Open Challenge Cup, for all types of aircraft; and a Balloon Bursting Competition.

THE WORLD'S DURATION RECORD.

At 05.15 hrs. on May 31 Capt. Arturo Ferrarin and Major del Prete took off from the Montecelio aerodrome, near Rome, on a Savoia S.64 (500 h.p. Fiat engine) in an attempt to beat the world's duration record.

They continued to fly over a 70-kilometre course in the neighbourhood of Ostia for nearly two and a half days, finally returning on June 2 to Montecelio aerodrome, where they landed at 15.45 hrs.

They remained in the air for 58 hrs. 37 mins., thus beating the previous record of 53 hrs. 29 mins. made by Messrs. Stinson and Haldeman on March 28-30, 1928, at Jacksonville, Florida, on a Stinson monoplane (220 h.p. Wright Whirlwind).

The Savoia 64 carried sufficient fuel for a flight of 62 hrs. and three days' provisions for the crew. The engine ran perfectly throughout the flight and the crew were quite fresh when they landed, and had actually shaved during the last few hours of their flight.

A SPANISH RECORD ATTEMPT.

At 11.19 hrs. on May 29 Capt. Jimenez and Capt. Iglesias, of the Spanish Army Air Service, left Tablada aerodrome, near Seville, on a Spanish-built Breguet XIX (600 h.p. Hispano-Suiza engine), in an attempt to beat the world's long-distance record by flying to India.

From Seville to Aleppo they experienced no trouble, but beyond Aleppo they passed through several heavy dust storms. At 16.00 hrs. on May 30 they passed over Baghdad at 6,000 ft., but two hours later they were forced to land in Dawiyah, a remote district, between the Tigris and Euphrates, some 200 miles south of Baghdad, after covering a distance of approximately 3,000 miles. The cause of their descent is believed to be due to the continued sandstorms, which finally affected the engine. The machine, which is undamaged, will be compelled to await the arrival of certain engine parts, and the British administrative inspector at Nasiriyah, 40 miles away, has arranged for a police guard for the machine. The two Spanish officers have proceeded to Baghdad, where they are the guests of the R.A.F.

LIGHT AEROPLANE HOUSING FACILITIES.

The following letter has been received, and should be of the greatest interest to all owners of aircraft :—

Sir,—We beg to inform you that we have now provided facilities for the housing of light aeroplanes at our works at Waddon, which are located at Croydon Aerodrome, and we desire to offer garage and maintenance facilities for private owners' machines.

We have decided to undertake the provision of these facilities because we think that it is desirable, and in the interests of all concerned, that accommodation for the housing of light aircraft should be available south of London.

We shall be pleased to quote terms to anyone interested, either by letter or telephone (Holborn : 4076), and we hope that private owners wishing to take advantage of this arrangement will communicate with us.

Petrol and oil can be supplied at usual rates, the services of ground engineers are available, and the fact that our works are the home of the Cirrus engine should also prove an advantage, as the great majority of light aeroplanes are fitted with this type of engine.

We should be much obliged if you could find space to refer briefly to this matter in your next issue, as we think it may be of general interest.

For and on behalf of A.D.C. Aircraft Limited,
(Signed) J. Stewart (Sales Manager).

THE ROYAL AERONAUTICAL SOCIETY.

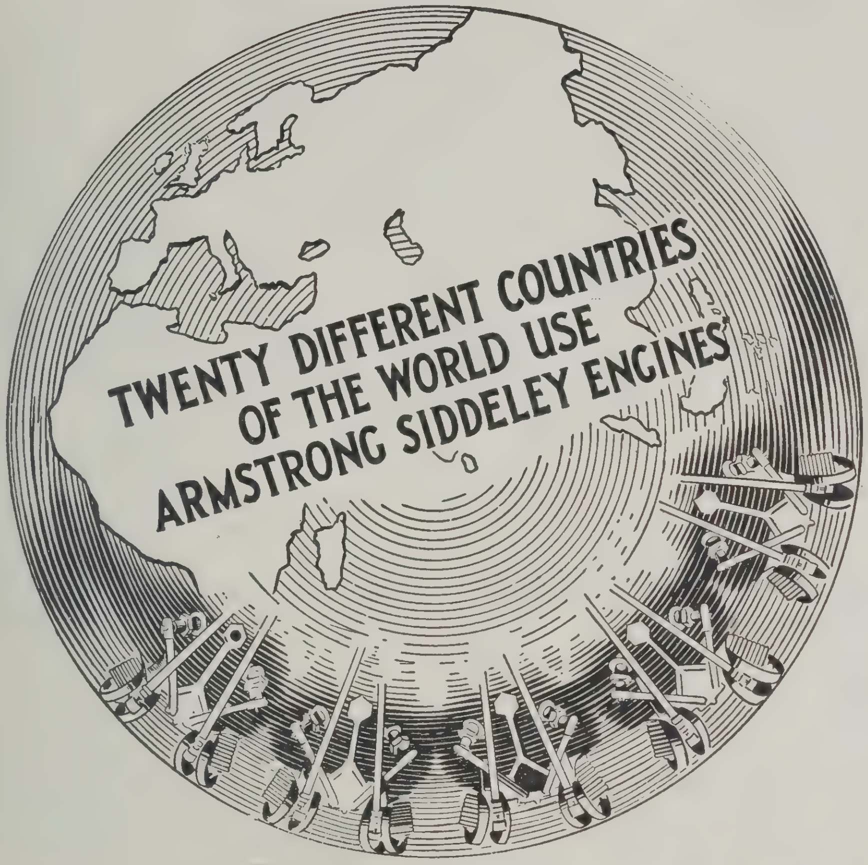
At the meeting of the Royal Aeronautical Society on May 30, the delivery by Mr. Handley Page of the sixteenth Wilbur Wright Memorial Lecture was preceded by the presentation by the President, Col. the Master of Sempill, of the Busk Memorial Prize for the best paper of the preceding year to Mr. A. A. Fage for the paper read on Jan. 5, 1928, entitled "Some Recent Researches on Fluid Motion."

At the same meeting Mr. H. E. Wimperis announced that the Council had requested Col. the Master of Sempill to continue to act as President of the Society for the year.

The amalgamation between the Royal Aeronautical Society and the Institution of Aeronautical Engineers occurred at the beginning of the present year. As Col. Sempill had played a large part in bringing about this fusion, it seemed to the Council only proper that he should complete a full term as the head of the joint body.

A TRANS-ATLANTIC OFFER.

If any British pilot is so foolish as to want to fly the Atlantic he can be put in touch with a monied person who is silly enough to want to pay for doing it and is capable of paying. Applicants, whose names will be treated in strict confidence, except as between this paper and the builder of the machine, are invited to write to the Editor of The Aeroplane.



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Because their simple construction does not demand the very highest grade of skill for their care and maintenance.

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14 cylinder Jaguar.
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A 63

THE ROYAL AIR FORCE.

The London Gazette.

May 29.

The King has been graciously pleased to approve the appointment of the Reverend R. E. V. Hanson, O.B.E., M.A., Chaplain-in-Chief, R.A.F., to be an Honorary Chaplain to his Majesty (May 19).

General Duties Branch.—Air Commodore E. A. D. Masterman, C.B., C.M.G., C.B.E., A.F.C., is placed on the half-pay list, scale A (June 1); Flg. Off. A. M. Webster is placed on the retired list on account of ill-health (May 30); Flg. Off. F. A. Pumphrey, D.C.M., is transferred to the Reserve, Class C (May 4) (substituted for the notification in the *Gazette* of May 8); Flg. Off. R. H. Giles is transferred to the Reserve, Class C (May 14).

Medical Branch.—The following Flg. Offs. are promoted to the rank of Flt. Lt.:—P. H. Perkins (June 1); S. F. Heatley, M.B., B.A. (June 2).

Chaplains Branch.—The Rev. A. McHardy, M.C., M.A., is granted the relative rank of Group Capt. on appointment as a Staff Chaplain (May 30); the Rev. W. Moffat relinquishes his S.S. comn. on account of ill-health (May 30).

Reserve of Air Force Officers.—General Duties Branch.—Flg. Off. J. H. C. Harold is transferred from Class B to Class C (May 26); Flg. Off. A. J. R. Adam relinquishes his comn. on completion of service (Dec. 2, 1927). The comns. of the following Plt. Offs. on probation are terminated on cessation of duty:—E. C. L. Basan (May 5), S. A. Adams (May 2), M. H Richardson (May 12).

Medical Branch.—Flt. Lt. F. K. Wilson, M.B., is transferred from Class D ii to Class D i (May 26).

Appointments.

Week ending June 5.

General Duties Branch.—Flight Lieutenants H. C. Irwin, A.F.C., to Royal Airship Works, Cardington, 1/6. H. E. P. Wigglesworth, D.S.C., and C. L. Falconer, to R.A.F. Depot, Uxbridge, 5/5. G. R. O'Sullivan, to No. 444 Flight, 2/5. F W. Sinclair, D.F.C., to No. 1 School of T.T. (Apprentices), Halton, 4/6.

Flying Officers E. D. Cummings, D.F.C., to R.A.F. Depot, Uxbridge, 23/5. Y. W. Burnett, to No. 47 Sqdn., Middle East, 14/5. J. H. Hutchinson, to No. 14 Sqdn., Middle East, 17/5. P. G. Lucas, to No. 404 Flight, 17/5. D. L. G. Bett, to R.A.F. Depot, Uxbridge, 5/5. A. S. Lewis, to R.A.F. Station, Hendon, 13/5. J. S. Blomfield, to R.A.F. Depot, Uxbridge, 28/4. C. G. Woledge, to No. 1 F.T.S., Netheravon, 22/5.

Pilot Officers.—The undermentioned Pilot Officers are posted to the R.A.F. Depot, Uxbridge, on appointment to S.S. Comns (on probation), with effect 25/5:—J. C. Allan, C. W. Black, R. A. Bloice, G. R. Chameroy, P. J. Connolly, H. Cook, J. Coverdale, J. Cox, P. J. J. Cullinan, R. F. J. Doran Webb, T. W. G. Eady, J. K. Flower, H. C. Friday, B. H. Gahan, J. C. Harcombe, G. A. E. Harkness, C. V. Howes, R. Lewis, M. L. McCulloch, A. C. Mitchell, E. C. Passmore, R. G. I. Pearse, P. K. Robertson, J. R. Robins, E. Rotherham, W. Smith, H. V. Thomas, R. E. Watts, P. C. Wilkin, and J. Wilson.

Medical Branch.—Flight Lieutenants P. D. Barling, M.B., to H.Q., Middle East, 9/5. A. F. Cook, to No. 2 Arm. Car Coy., Middle East, 1/5.

Accoountant Branch.—Flying Officer C. F. Goatcher, to H.Q., Aden Command, 16/5.

Chaplains Branch.—The Rev. A. McHardy, M.C., M.A., to H.Q., Inland Area, Stanmore, 30/5.

The King's Birthday Honours.

The following Officers of the Royal Air Force and officials at the Air Ministry are included in the official list of honours conferred by the King on the occasion of his 63rd birthday:—

Order of The Bath:—K.C.B. (Military Division) Air Vice-Marshal Sir John Frederick Andrews Higgins, K.B.E., C.B, D.S.O., A.F.C., R.A.F.

C.B. (Military Division) Air Commodore Edgar Rainey Ludlow-Hewitt, C.M.G., D.S.O., M.C., R.A.F.

Order of The British Empire:—C.B.E. (Military Division) Group Captain George Laing, O.B.E., R.A.F.

O.B.E. (Military Division) Sq. Ldr. Alan Fitzroy Somerset-Leeke, R.A.F.; Miss Christine Cameron, R.R.C., Matron, Princess Mary's R.A.F. Nursing Service; the Rev. Maurice Henry Edwards, B.A., Chaplain, R.A.F.

M.B.E. (Military Division) Flt. Lt. Hugh Nelson, R.A.F.; 1734, Sergeant-Major 1st Class Reginald Arthur Howes, R.A.F.; 206950 Sergeant-Major 2nd Class Herbert William Smith, R.A.F.

O.B.E. (Civil Division) Walter Cecil Fenwick, Esq., Contract Officer, Air Ministry; Robert William Strugnell, Esq., Assistant Civil Engineer, Works and Buildings Department, Air Ministry.

Air Force Cross:—Horry, Flt. Lt. Thomas Stanley, D.F.C.; Barbour, Flt. Lt. Robert Lyle McKindrick, D.F.C.; Greig, Flt. Lt. David D'Arcy Alexander, D.F.C.

Air Force Medal:—Woods, 187186 F-S. (Pilot) Harry Walter; Arney, 341882 L-AC. Francis Thomas.

The King's Levee.

His Majesty the King held a Levée at St. James's Palace on June 1.

The General Company included Marshal of the Royal Air Force Sir Hugh Trenchard, who presented a number of officers of the Royal Scots Fusiliers to His Majesty.

The following officers of the R.A.F. were presented to His Majesty by the Secretary of State for Foreign Affairs:—

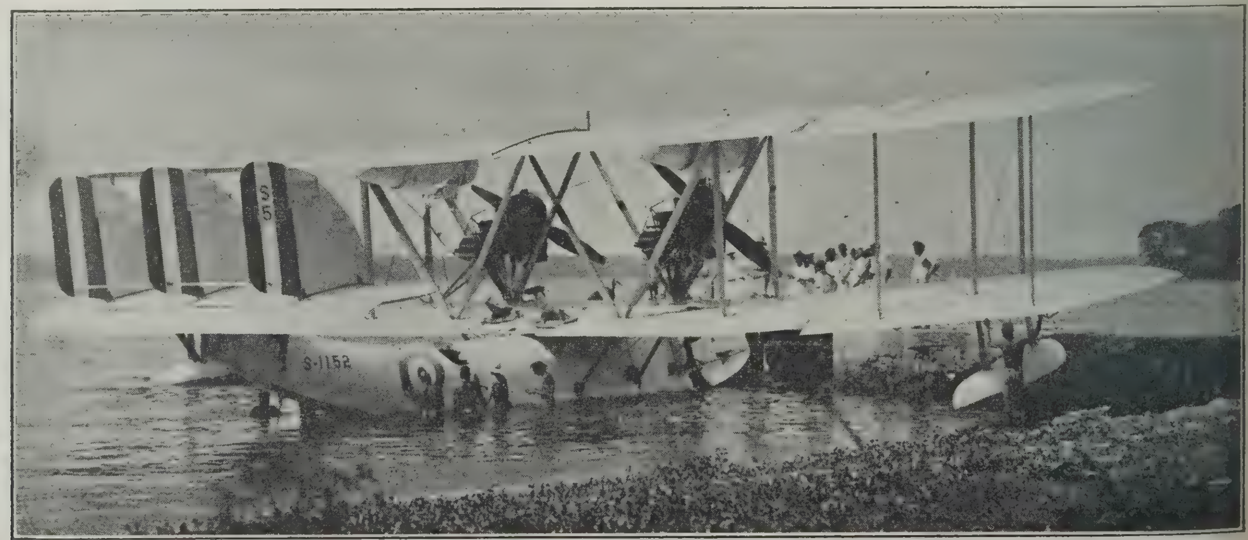
Barraclough, Flt. Lt. J., on appointment; Battle, Flt. Lt. H., on appointment; Bradley, Wing Cdr. J., O.B.E.; Bryer, Flt. Lt. G., O.B.E., A.F.C., on appointment; Carr, Flt. Lt. C., D.F.C., A.F.C., on appointment; Caulfield, Flg. Off. J., on appointment; Combe, Flt. Lt. G., on appointment; Eliot, Flt. Lt. W., D.F.C., on appointment; Fielden, Flg. Off. E., on appointment; Findlay, Flg. Off. R., on appointment; Foden, Flt. Lt. J., on appointment; Foster, Sq. Ldr. C.; Gardiner, Flt. Lt. G., D.F.C., on appointment; Hardman, Flt. Lt. J., D.F.C., on appointment; Hordern, Flg. Off. E., on appointment; Kirkman, Flt. Lt. H., on appointment; Laws, Wing Cdr. F., O.B.E., on promotion; Lawson, Flt. Lt. J., on appointment; Miley, Wing Cdr. A., O.B.E.; Moore, Flt. Lt. T., on appointment; Pidcock, Flt. Lt. G., on appointment; Robinson, Flt. Lt. F., on appointment; Seward, Flt. Lt. W., on appointment; Slocombe, Flg. Off. P., on appointment; Stone, Flg. Off. C., on appointment; Weston, Sq. Ldr. W., on promotion.

A Royal Appointment.

The Air Ministry announces:—

His Majesty the King has been graciously pleased to approve of the following appointment:—The Reverend Robert Edward Vernon Hanson, O.B.E., M.A., Chaplain-in-Chief, R.A.F., to be an Honorary Chaplain to His Majesty.

The Rev. R. E. V. Hanson was born in 1866 and educated at King's College, London, and Emmanuel College, Cambridge. He was appointed Chaplain to the Forces in 1900 and served in the South African War, and in Egypt and Malta and in France during the War 1914-18. He was appointed Deputy-Chaplain-in-Chief to the R.A.F. in 1918 with the relative rank of Group Captain, and Chaplain-in-Chief to the R.A.F. with the relative rank of Air Commodore in October, 1926.



THE FAR EAST FLIGHT.—One of the Supermarine Southamptons (450 h.p. Napier Lion engines) having the barnacles removed from the hull by native labour at Trincomali.

Another great achievement!

Sir Alan Cobham

used

MAGNETOS

for his

23,000 miles African Flight

B.T.H. Magnetos were used also for his 28,000-mile Australian Flight and his previous flight to South Africa. Capt. Hinkler used B.T.H. magnetos for his 16-day flight to Australia and both Major Segrave and Capt. Campbell used B.T.H. magnetos in creating World's Speed Records for Cars.

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The Far-East Cruise.

The Service cruise of four Supermarine Southampton flying-boats (Napier Lion engines), under the command of Group-Captain H. M. Cave-Browne-Cave, D.S.O., D.F.C., which left Cattewater on Oct. 17, 1927, arrived at Bima, Sumbawa, Dutch East Indies, on May 29, and flew to Koepang, Dutch East Indies, on May 30.

On June 1 the Flight arrived at Broome, Western Australia, having flown from Koepang in six hours and fifty-five minutes.

On June 3 the Flight left Broome for Port Hedland. Owing to the exposed nature of their anchorage at Broome, the flying-boats dragged their moorings and had to be taxied about the bay until the wind lessened.

Policing ‘Iraq.

According to the Basrah correspondent of *The Times* Ghadhban al Khayiun, a lawless tribal leader, who, as head of a gang of highway robbers, has been a source of much trouble to the ‘Iraqi authorities, was recently summoned by a message dropped from a R.A.F. aeroplane to surrender within a fixed period.

Ignoring the order, Ghadhban renewed hostilities, whereupon aeroplanes, combined with the police forces stationed at Chibayish, in the marshy regions of Nasiriyah and Liwa, began operations, which were successful. Many of the gang were killed, and Ghadhban's sword and equipment were seized. Ghadhban himself is believed to have been killed, seriously injured, or drowned.

Ghadhban's brother, Sheikh Salim, of the Beni Asad tribe, is in custody owing to violent opposition to the Anglo-‘Iraqui Treaty of 1922.

Air Defence Practice.

Gunnery training against aircraft will be carried out at Watchet this year with full-charge practice against targets towed by aeroplanes, reduced charges against aeroplanes, shrapnel fire at a target towed by a low-flying machine representing a close-range bomber, barrage practice, and night firing at aircraft with searchlights at smoke-burst targets. Various kinds of air attack will be arranged, such as formation attacks and simultaneous bombing at different heights. The R.A.F. will supply three types of aeroplanes for gunnery training in picking up targets of various size and speed. There will be wireless communication between the ground troops and the aeroplanes, and meteorological information will be telegraphed by the Air Ministry daily.

Interpretership Awards.

Beginning with the June, 1928, examinations, the award for a first-class interpretership in French will be increased to £50. The second-class award will remain at £12. Second-class interpreters who qualify as first-class interpreters will be granted the difference between £50 and the award already received, and officers who re-qualify as first-class interpreters at intervals of not less than three years will receive £12 10s.

Spanish has been added to the list of languages approved for the grant of an award and examinations will be held in future under the regulations at present in force for French and German. The following awards will be made to officers who qualify in Spanish according to the regulations :—Second-class interpreters, £25; First-class interpreters, £50; Second-class interpreters qualifying as first-class, £25; First-class interpreters on re-qualification at intervals of not less than three years, £12 10s.

THE FAR EAST FLIGHT.—A collapsible dinghy, one of which is carried by each of the machines of the Flight.

The number of officers who may be permitted to qualify for awards in Spanish will be limited.

Temporary Stations.

The University Squadrons will move to regular R.A.F. stations for their annual training, and will be located as follows :—

Oxford University Air Squadron to the School of Technical Trainin (Men), Manston, Kent, from June 24 to Aug. 21.

Cambridge University Air Squadron to the School of Army Co-operation, Old Sarum, near Salisbury, Wiltshire, from June 9 to July 20.

Shanghai Defence Force Allowances.

The rates of colonial allowance issuable to officers serving with the Shanghai Defence Force have been increased by $1 a day, with effect from the date of disembarkation.

This increased allowance is payable to all R.A.F. officers up to the rank of Group Captain who served in Shanghai. Claims for payment should be submitted to the Accountant Officer of the unit at which officers are now serving, who will forward the claims to the Air Ministry.

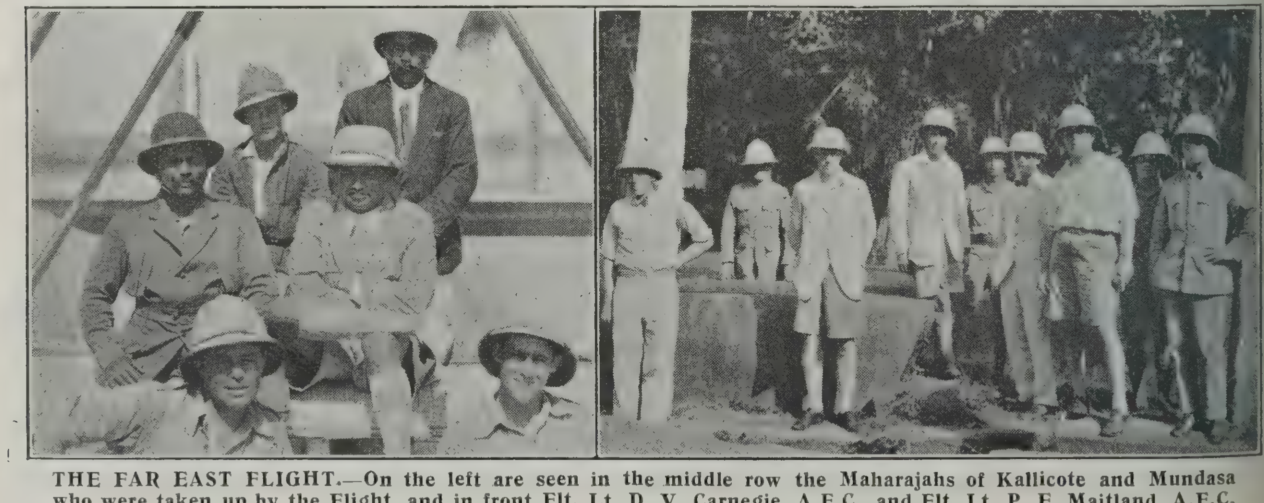
Fencing at Olympia.

The team bayonets' combats to decide the Services Championship and the Inter-Service Championship were fought at Olympia on May 26. The combats are fought by teams of 18 a side from each Unit. In the R.A.F. final Lee-on-Solent beat Flowerdown by 10 assaults to 7.

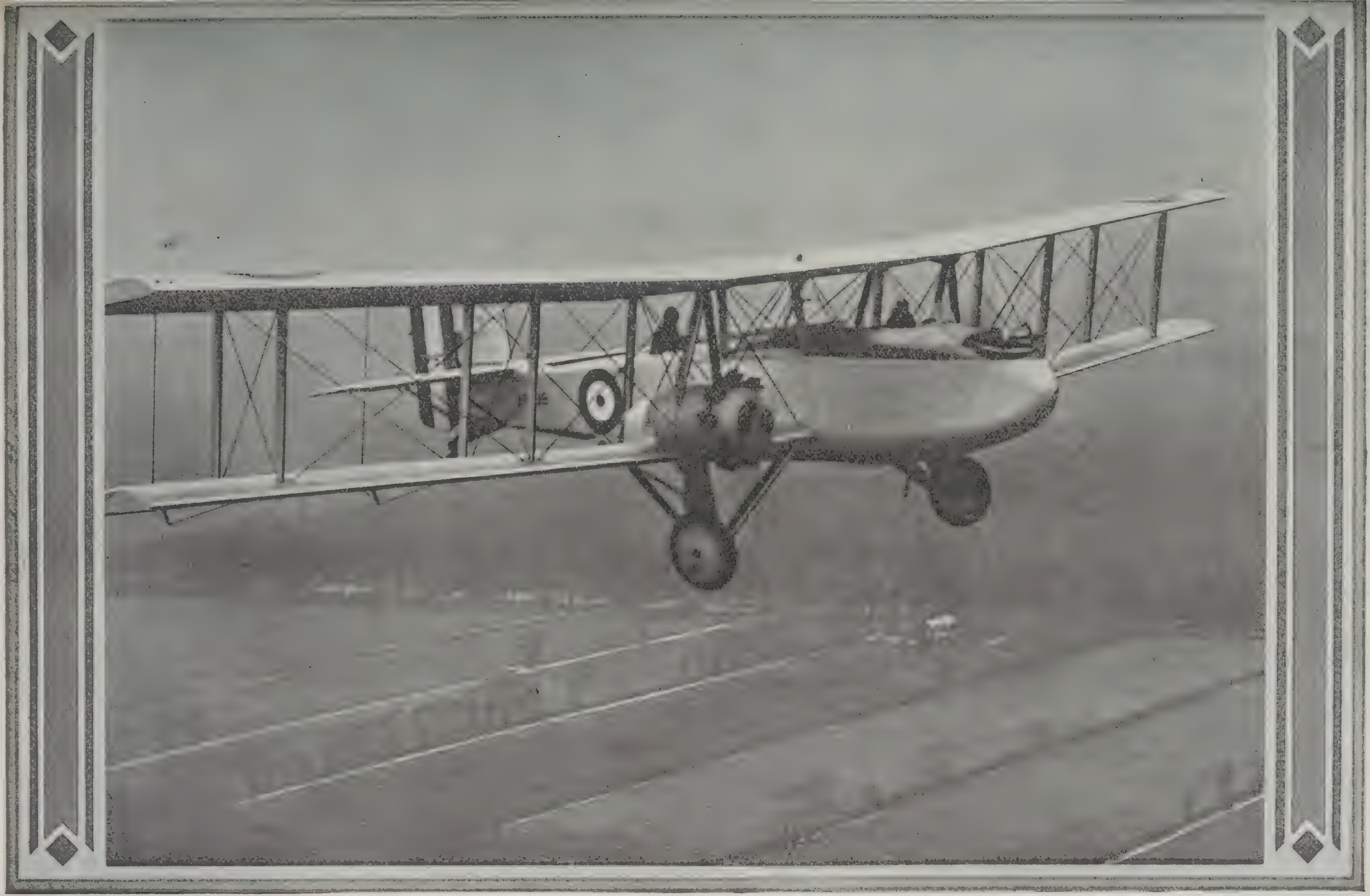
In the inter-Service Championships the R.A.F. were beaten by the Army in the semi-final. The Army were beaten by the Marines in the final.

Cadets from the three Services competed in the fencing events at Olympia on June 2. Flt. Cadet Tindal-Carill-Worsley of the R.A.F. Cadet College won the sabre competition for the second year in succession and in addition was awarded the medal for style.

With the foils Flt. Cadet J. J. Owen, R.A.F. Cadet College, Cranwell, was defeated in the final by Gentleman Cadet B. C. Seton, R.M.C., chiefly owing to lack of reach but was awarded the medal for style. The third place in this event went to Flt. Cadet R. B. Counsell of Cranwell.



THE FAR EAST FLIGHT.—On the left are seen in the middle row the Maharajahs of Kallicote and Mundasa who were taken up by the Flight, and in front Flt. Lt. D. V. Carnegie, A.F.C., and Flt. Lt. P. E. Maitland, A.F.C. On the right are some of the Flight at Trincomali.



(Photograph by "Aeroplane.")

BOULTON & PAUL ALL-METAL "SIDESTRAND" DAY BOMBER.

The R.A.F. Display at Malta.

On May 18 Air Commodore R. H. Clark-Hall, C.M.G., D.S.O., and Officers of the R.A.F. and Fleet Air Arm, were at home to some two thousand guests at Hal Far Aerodrome, with "Flying Events 3.30-5.30."

Long before zero hour a steady stream of cars began to flow from Valletta, and by the time H.E. The Governor and Lady Du Cane had arrived most of the cars in the Island seemed to have concentrated on the aerodrome.

One extremely unwelcome guest from the Airmen's point of view had arrived earlier in the day from Africa. This was the Sirocco wind, which brought bad visibility, bumps and damp heat in its train. Indeed, from 2,000 feet the ground was almost invisible.

At 3.30 to the minute a massed "Vee" formation, consisting of Bisons, Fairey III.D Floatplanes, Darts, and Flycatchers, flew over the circle, and on a Verey Light signal broke up into flights, to recross the Aerodrome from different directions three minutes later.

An air combat between a reconnaissance machine and two fighters looked particularly effective, the Bison having disposed of one Flycatcher suddenly bursting into flames (Holt flares and Stannic Chloride) and spinning into the ground (or at least below the level of the cliffs), leaving the gallant gunner, L-AC. Dummy, to effect his escape by parachute.

After the Relay Race, in which three teams, composed of four different types of aircraft, took part, three Flycatchers gave an exhibition of looping, rolling, inverted flying, and double-bunting in formation. This was a most popular event.

At 4.30 there was a parade of aircraft (including a comic aeroplane), followed by two dummy parachute drops from a Bison.

The last event, "The Attack," was the *pièce-de-resistance*. The extension of the aerodrome and consequent demolition of houses, made it possible to leave one house to be destroyed from the air. This was built up to represent an enemy fort, and after a formation of five bombing machines had passed overhead it was seen to explode with much flame and clouds of black smoke. A defending tank, firing at the aircraft, was then bombed, abandoned by the enemy, and blown up by single-seater fighters.

At 4.30 H.E. The Governor was presented with an enlargement of a photograph of the Officers' Enclosure and Hangars taken from the air an hour earlier.

The only crash was that of fifty plates, dropped by a Maltese waiter when the fort blew up; and one may perhaps be pardoned for overhearing and repeating the remark of a distinguished visitor, who said: "This is, of course, *the* show of the year."—M. W.

AN AERONAUTICAL KNIGHTHOOD.

The King's Birthday Honours include the award of a Knighthood to Captain George Hubert Wilkins, M.C., who recently flew across the North Polar Regions from Alaska to Spitzbergen.

Many may ask why, for a flight over uninhabited and useless country an honour is granted as for the great pioneer flights of the past across the Atlantic, to Australia, to the Cape and so forth. The answer seems to be that some day there may be an air-line from America to Europe across the North Pole, as the shortest way, and that Capt. Wilkins is the pioneer of that route.

Captain George Hubert Wilkins, M.C., was born in Australia in 1888. He has been a naturalist and explorer. During the War 1914-18 he held a commission in the Australian Flying Corps.

In 1919 he made an attempt to fly to Australia, for the prize which was won by the Smith Brothers. He wrecked his machine in Crete when trying to get off there. For about two years from 1923 he was lost in the wilds of Northern Australia while engaged collecting specimens for the Natural History Museum, South Kensington.

In 1925 or so he explored to the North of Canada with Steffansen, and in 1926 he did some flying in those regions with the intention of making the journey which he recently accomplished.

A LECTURE BY SIR GEORGE WILKINS.

Capt. Sir George H. Wilkins, recently knighted for his Polar flight, will lecture before the Royal Aeronautical Society on Thursday, June 14, at 6.30 p.m., at the Royal Society of Arts, 18, John Street, Adelphi, W.C.2.

He will deal with the difficulties of Arctic flying, and will outline the kind of machines which are necessary, and all the modifications which were found essential for the conditions he had to face.

Advance copies of the paper will be available, price 6d. each, and admission to the hall will be by *ticket only*, available from J. Lawrence Pritchard, Secretary, the Royal Aeronautical Society, 7, Albemarle Street, W.1.

THE BANQUET TO MR. A. V. ROE.

Those who have tickets for the banquet to Mr. A. V. Roe at the Savoy on June 8 are asked to remember that the time is 7.30 for 8, and that they should be there as soon as possible.

All the available tickets have now been sold, and somewhere over 400 people will assemble to honour Mr. Roe.

THE MALTA DISPLAY.—A flight of Fairey Flycatchers flying over the enclosures during the R.A.F. Display at Malta. The Headquarters of the R.A.F. Mediterranean Command is stationed at Malta, and also the R.A.F. Base and No. 481 (Coastal Reconnaissance) Flight. The Flycatchers in the photograph belong to No. 402 (Fleet Fighter) Flight, H.M.S. "Eagle."

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An "Investigation Flight" carried out under normal aerial touring conditions.

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Hungary	Buda-Pest
Jugo-Slavia	Belgrade
Bulgaria	Sofia
Turkey	Constantinople
,,	Burgas
Roumania	Bucharest
,,	Tecuciu
,,	Tassy
,,	Czernowitz
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MR. HANDLEY PAGE'S WILBUR WRIGHT MEMORIAL LECTURE.

By their selection of Mr. Handley F. Page to deliver the sixteenth of the annual Wilbur Wright Memorial lectures the Council of the Royal Aeronautical Society displayed a nice sense of the fitness of things. The essence of the achievement of the Wright Brothers was the development of an effective type of aeroplane control which made flying for the first time a practicable possibility.

The Wright type of control ceases to function satisfactorily when the aeroplane to which it is fitted is stalled, and this defect of all normal aeroplane control systems has been responsible for more serious flying accidents than has any other cause. Mr. Handley Page by producing the slotted wing has carried the work of the Wright Brothers one step further and has made controls effective past this hitherto impossible limit.

In addition Mr. Handley Page is one of those rare lecturers who can enliven a technical discourse packed with abstruse information in such a way as to interest both those hearers who can follow him and those who cannot. Thus he was enabled to keep a large audience—by no means entirely technical in its composition—thoroughly interested on this occasion.

The *précis* which follows of his lecture on the Slotted Wing is necessarily confined to the broader outlines. All those who need the detailed technical data which were given, must await the publication of the full paper in the Journal of the R.Ae.S.

The Lecture.

Mr. Handley Page said that only now could one realise how thorough were the methods which led the Wright Brothers to their success. Lillienthal's gliding—brought to an untimely end by lack of control—showed that the secret of success was to be sought by experiments in free flight.

The Wrights, abandoning Lillienthal's acrobatic control, carried through the whole modern programme of wind-tunnel research, detail design, construction, and, finally, flying tests, and thus discovered the essential features of aeroplane control which had been used in practically every aeroplane that has ever flown.

In the original Wright aeroplane and in all its successors the means used for varying the lift were those of altering the angle of incidence, or of changing the camber of the wings, either by warping or by the use of flaps. This change of lift had been, and still was, used to change the air speed of the machine, or, applied to part only of the wing surfaces, to control it.

In the development taking place through the use of slots the original angular limits within which the aeroplane might safely be flown were extended and the control was so improved as to make safe the range of stalled flight in which the original type of control was of no avail.

The increased range of angles through which increasing lift could be attained by the use of slots was limited only by the number of slots used. The ultimate development of slotted wings must depend on mechanical considerations, and with growing mechanical experience—which came but slowly—large numbers of slots might be used—particularly now that a fashion for their use had set in.

The Two Uses of Slots.

Two courses were open to the designer who proposed to use slots. The first and most obvious was to fit them over the whole wing span, thus increasing maximum lift, obtaining a wider speed range and a better performance—that is if the added weight of the mechanism did not offset the advantages gained.

The second course was to fit slots to a part only of the span and to use them to give that control at and beyond the stall which the normal aeroplane lacked.

The Effect of Slots.

Turning to the effect of slots the lecturer showed firstly a series of lantern slides of the flow past a wing slotted and unslotted and then a series of curves showing the results of model tests made on medium and thick section wings with slots to supplement the results already available for thin sections.

Structural requirements nowadays were forcing designers to the use of thicker sections and it was therefore interesting to know that increases in lift comparable with those found with thinner sections, could be achieved with these thicker sections.

On these, or any, section fitted with front slots it was advisable to use also a slot in front of the aileron or flap. This not only increased the lift still further but it reduced the angle of incidence of the maximum lift to a more convenient value. In the case of R.A.F.31, maximum lift unslotted occurred at 12.3°. Slotted in front only the angle of maximum lift rose to 23.8°, but by adding a slotted flap this could be reduced to 18°, which was within the range of practicable use.

Full-scale tests confirmed the model results and slotted wings did not show that fall in maximum lift caused by scale effect which had been found in some high-lift wings.

These results showed that the designer need no longer be limited in his choice of wing area by consideration of a fixed landing speed associated with a maximum lift coefficient of 0.5 to 0.7. He could raise that figure by nearly 100% by fitting slots, and choose a section and an area for best performance.

When this method was used to reduce wing area, it was well to reduce chord rather than span otherwise the induced resistance would increase. The change in profile drag caused by slots would depend on the type of slot used, and there was room for much further research as to the factors which influence the profile drag of slotted wings.

Slots for Control Only.

If slots were fitted to the leading edge of the outer section of the wings only, in front of the ailerons, the wing-tips would stall at larger, and therefore later, angles than the central section. As "burbling" started at the centre and spread outwards, a machine so fitted could be flown with its centre section stalled but its wing-tips working in a normal air flow.

If rolled that machine would experience a righting moment as in normal flight, and also would respond correctly to aileron movement.

The tail controls of normal aircraft were not powerful enough to stall wing-tips so fitted, and such a machine became immune from the dangers of the involuntary stall.

Such slots permanently open would increase the resistance and spoil the performance of the machine at small angles. It was necessary therefore that they should open only as the incidence rose towards stalling angle and that they should close as it fell away from the stall.

The Automatic Slot.

The resultant of air pressure on the forward aerofoil of a slotted wing (as shown in lantern slides) was such that if this forward aerofoil were supported on a suitable link system it would open automatically as the incidence rose to about 8° and close again as it fell to a similar angle.

The exact movement of the front aerofoil in the process of opening was important. If in any intermediate position the trailing edge of the front aerofoil rose well away from the surface of the main aerofoil while the two leading edges remained close together, "burbling" was provoked, and a force set up which closed the slot. The movement must be such as produced a correctly shaped slot with an entry wider than the exit at all stages.

The diagrams of pressure shown were those of pressure on the top surface of the front aerofoil. If this front aerofoil did not fit snugly at both edges there would be other pressures on the under surface of the front aerofoil. If there were a gap at the leading edge there would be a pressure tending to hasten opening of the slot. If the gap were at the trailing edge there would be a negative pressure tending to delay opening.

Perfect fit was not practicably attainable and the result of "venting" was important as it greatly changed the total and the direction of forces on the front aerofoil. The forces in the absence of any "venting" usually tended to cause too early an opening, therefore usually the gap should be made to come at the trailing edge to retard the opening.

To design an automatic slot for any given aerofoil it was essential to have complete data for the pressure distribution on the front aerofoil, both with slot open and closed, so that the mechanism might be arranged to give correct opening and closing.

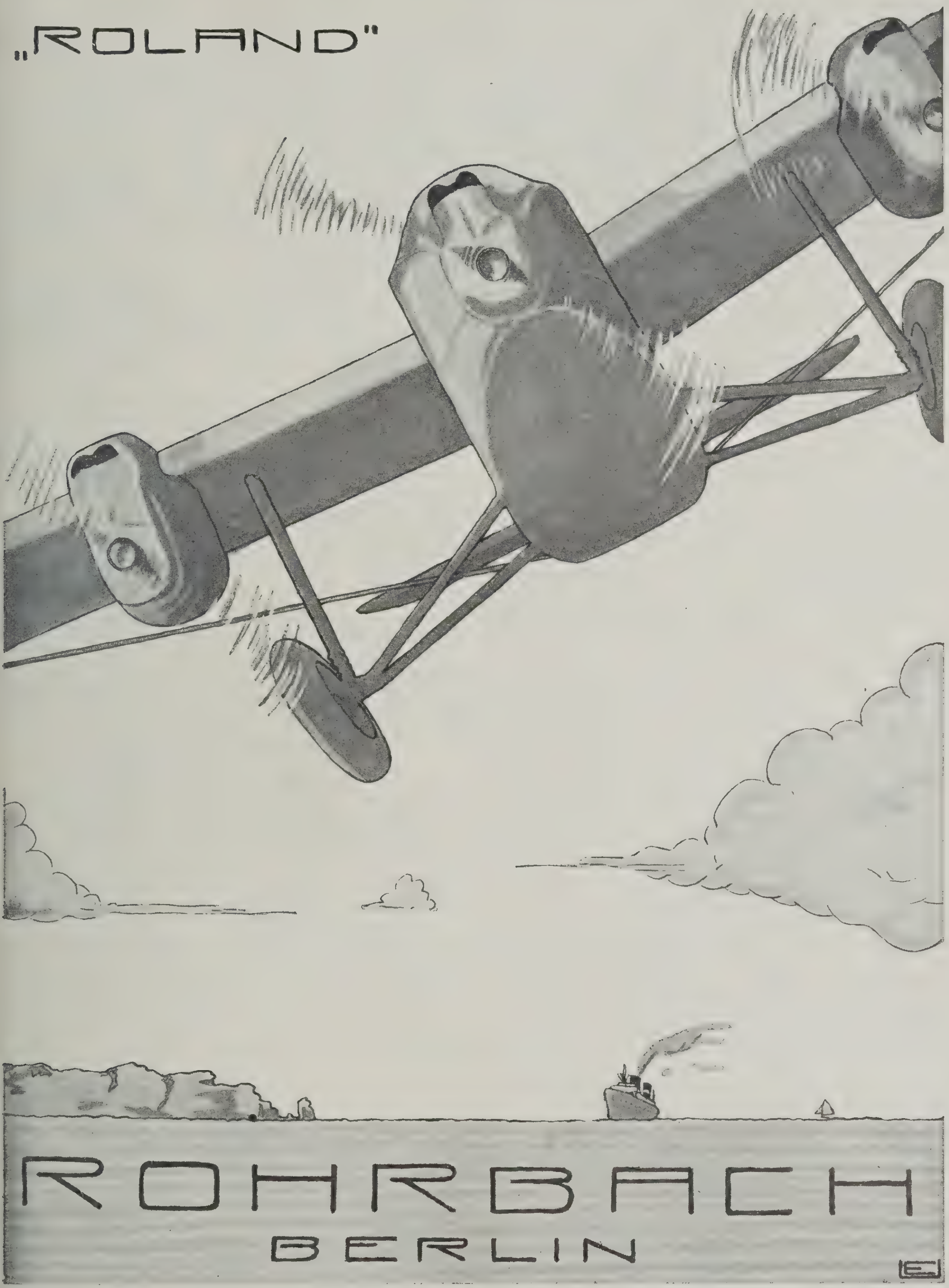
It was not enough to produce a slot which on full-scale test opened and closed at the desired angle of incidence and to an extent that looked sufficient. The correct form of slot must be produced.

For a biplane slots need only be fitted to the top wing. The lower wing of a biplane did not stall until an angle much greater than that which caused stalling on the upper wing, and in general the lower wing of a biplane was never stalled.

The Size and Arrangement of Control Slots.

The form of slot which gave the best results when used over the whole span of a wing was not necessarily the one best suited for use over part of the span only for control purposes. To obtain data to guide designers tests had been made in the Handley Page wind-tunnel with front aerofoils of differing chords and spans, relative to the chord and span of the main aerofoil, and set at different positions along the span of the main aerofoil.

Measurements of lift showed little indication of the merits of these different arrangements, but measures of rolling and yawing moments made with various aileron settings showed that their effectiveness for control purposes varied considerably.



IF . . . .

If one engine fails, what———?
Most aeroplanes equipped with two engines, or three, would be compelled to make a forced landing in this case.
Forced landing, that means: late arrival, perhaps danger to passengers, pilot and craft.

There is only one three-engined all-metal aeroplane in the world which maintains straight level flight (under full load) with only two engines running:

THE "ROHRBACH ROLAND."

Increasing the chord of the front aerofoil increased the rolling moment, and placing the auxiliary aerofoil inboard from the wing-tip increased rolling moment and decreased yawing moment. Increasing the span of the forward aerofoil beyond one-sixth of the wing span did not improve the control qualities appreciably.

With the best combination tested the control available when both slots were open—as with the automatic type—was nearly, though not quite, so good, as that given when the slot in front of the upturned aileron was closed—as occurs in the case of interconnected slots and ailerons.

Though better control, particularly at very large angles of incidence, can be attained by interconnecting the ailerons with the slots, the weight and complication of the necessary control gear is a draw-back. This may be overcome by using the " spoiler " or " interceptor."

This is a narrow flap hinged along one edge and normally lying flush with the upper wing surface, parallel to, and just aft of, the outlet of the slot. It is coupled to the aileron in such a way that when an aileron is raised the flap in front of it is turned about its hinge and projects vertically from the wing surface. It then so disturbs the flow over the wing as to cause " burbling " despite an open slot ahead of it.

Up to angles of incidence of about 20° this interceptor gave better control than even interconnected slots and ailerons. Above 20° the interconnected arrangement was slightly better.

Full-scale tests of a biplane with " interceptor " control confirmed the results of model tests and showed that this control was as light as, and no different in feel from, the ordinary aileron.

All the tests so far mentioned related to front aerofoils which when closed conformed to the outline of the original wing-section. Mr. Bruce of the Westland Aircraft Works had developed a type of front aerofoil which was added on to the original section like a plaster. This seemed to give as good results as the other type and was simpler to make, particularly in cases where slots were to be fitted to existing wings.

It looked better to keep the same section throughout, but if equally good results could be attained at less cost by not doing so it went to show how little we knew about wing sections. It had been said that any wing section was almost as good as any other, and perhaps this was true if they were slotted wings.

Summing up the present state of knowledge Mr. Handley Page enunciated the following conclusions :—

(1) By using slots on thick wings increases of lift equal to those obtainable on thin sections could be attained.

(2) As the improvement in control given by slots depended on increase of lift, the same improvement could be attained with thick as with thin wings.

(3) Where slots were used over part of the span only the best control would be given by fitting the slots with their ends a little inboard from the wing-tips.

(4) With correctly designed and placed slots opening automatically a very good control at and beyond the stall could be obtained without the complication of interconnected slots and ailerons.

(5) If still better control were desired beyond the stall, particularly at very large angles of incidence, then either a controlled front slot or an " interceptor " should be used.

Mr. H. E. Wimperis (Director of Scientific Research, The Air Ministry), moving a vote of thanks to the lecturer, said that Wilbur Wright lectures were immune from discussion. He was not Peter, and the day of Judgment he understood should have been the day before, but he intended to point out one fault in this lecture. Mr. Handley Page had failed to say all that he might have said in praise of the slot.

It seemed sometimes to be forgotten that pilots had only two arms and two legs apiece, and that these were fully occupied with the usual controls. The automatic slot was a most ingenious and valuable invention.

When the slot was first described some years ago it aroused great interest and had led to a great deal of research. From this had resulted a vast amount of knowledge and that knowledge had made possible the production of the automatic slot. But the step from the necessary knowledge to the practical application thereof was not as easy as some people imagined. Anyhow they had all had the knowledge but only Mr. Handley Page had successfully applied it.

Dangerous though prophecy was he was going to indulge in it. The slot when in regular use was going to prevent 50% of all the crashes that would have occurred without it. And that 50% would include all the most deadly and dangerous type of accident.

The slot was an invention that must go round the world, and its inventor was a benefactor to this country. Britain used to be the industrial workshop of the world, carrying out all the simple mechanical work needed by other countries. To-day those countries could do their own simple jobs, and if we were to hold our position in the world we had to find out how to do difficult jobs for other nations—such as producing stainless steel, artificial silk, and automatic slots.

Lt.-Col. J. T. C. Moore Brabazon, seconding the vote of thanks, congratulated the author on a lecture worthy of the occasion. There were no yawning moments in it. The slot was a great contribution towards safety and it was safety that was needed to lead to proper public interest in the development of flying. He only wished he himself had a penny in the " Slot."

Mr. Handley Page, expressing his appreciation of the honour done to him in selecting him to read the Wilbur Wright Memorial Lecture, recalled the fact that it was now seven years since he had first described the slot before the R.Ae.S., and that it was only now that it was coming into use for control purposes.

It was for precisely the period of seven years that Jacob had laboured to gain the wife of his desire only to attain Leah as a consolation prize. However another seven years of toil had won Rachael for him, so that he himself might in another seven—but not, he hoped, lean—years find the slot beginning to be used to its full capacity for improving both performance and control.

U.S. NATIONAL BALLOON RACE.

On May 30 the National Elimination Balloon race was held at Bettis Field, Pittsburgh, in spite of the fact that a thunderstorm warning was issued by the U.S. Meteorological Bureau. The object of the contest was to choose a team of three to represent the U.S.A. in the 1928 Gordon-Bennett Race.

Fourteen balloons started, but thirteen were forced down before proceeding far from Bettis Field. Army balloon No. 3, containing Lieuts. Everet and Ent, was set on fire, and Lieut. Everet was killed. Lieut. Ent succeeded in bringing the balloon safely to earth without injury to himself. Goodyear No. 5 was also struck by lightning, and Mr. T. W. van Orman, the pilot, jumped with his parachute, and broke his leg on landing. His assistant was found dead near Youngwood, Penn. One Navy balloon was caught in the superstructure of a mine shaft, but the occupants escaped injury. Only one balloon, Army balloon No. 1, succeeded in remaining aloft, and this landed at Weems, Va., after a 12-hour battle with the storm.

BOOKS TO READ.

A PIONEER'S RECOLLECTIONS.

[" Memories of Land and Sky." By Gertrude Bacon, F.R.A.S., 244 plus VIII pages, 24 illustrations. Methuen and Co. Price 7s. 6d. net. Obtainable from The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4.]

In the early days of Aviation the name of Miss Gertrude Bacon was as well known among the aeronautical community as was that of most of the star-turn pilots of the day. In the days before flying Miss Bacon was already famous as a balloonist, because of the historical journeys which she made with her father, the Rev. John M. Bacon,—a scientific aeronaut of high standing. Of late Miss Bacon, though still taking a keen interest in flying, has not been much in evidence, and so her name is not well known to the younger generation who are keen on flying, except in those schools where her fascinating lectures have done so much to spread the Gospel of the Air. One recommends that those who do not know her proceed forthwith to make her acquaintance in print.

Miss Bacon was, in fact, the first Englishwoman to ascend in an aeroplane, and, though much of her book is concerned with matters other than aeroplanes, that will at once be a bond of sympathy between her and her readers. Moreover, she has essentially the aviating temperament. She has the peculiar sense of humour which belongs to aerodromes, and whatever she does she is full out about it.

Reading her book is much more like being talked to by a friend than like reading the usual biography. Miss Bacon confesses to being in the early fifties, but from her writing it is evident that she will never really grow up, and that she has the enthusiasm of youth for everything which interests her. As she says herself, the half-century that is within her own memory has been not only the most momentous, but also the swiftest in the history of mankind. Through force of circumstances she has hung onto the skirts of great movements, and as an onlooker she has seen most of the game.

She has seen the development of Cycling, and of Motoring, and of Aviation, and in all those three great developments she has taken an active part. She has met very many of the people who have made the history of the past half-century, and even before, seeing that one of her reminiscences includes Sir Harry Lumsden " of the Guides," who raised that historic corps in 1846 and, incidentally, introduced khaki into the British Army.

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Her adventures in balloons, and in an experimental airship before even an aeroplane flew decently, are as wildly exciting as anything in a modern thriller. And straightaway from such adventures she discourses on such highbrow matters as a couple of voyages with her father to observe total eclipses of the sun. These trips involved going to India and to America, and the accounts of those journeys, with her shrewd observation of the people of those two continents, are themselves particularly well worth reading.

Apart from these aerial adventures, she also had the unusual experience for a woman of going diving in the regulation diver's dress, and of being nearly killed in a gas explosion.

Miss Bacon's experience of being the first Englishwoman to fly was at the first great Aviation Meeting in the World, that at Reims, in August, 1909. One can vouch for the accuracy of her description of the meeting, because one happens to have been there oneself, along with a certain Edgar Wallace who has since attained considerable fame. To Miss Bacon also belongs the distinction of being the first woman to cross the Channel in an authorised air-line machine after the War, although the article which she was to have written as such for a newspaper was unfortunately antedated by an article written by a man, though purporting to have been written by a woman.

Of her valuable work during the War Miss Bacon has said little, which is a pity. But what little she says throws a new light on several things concerning the War which ought to have been, and still might be, better illuminated. One has hopes that not too many years hence Miss Bacon will write yet another book of reminiscences, for this is so informative, so amusing, and so charming in its manner that her readers could well do with more of it.—C. G. G.

AERIAL PHOTOGRAPHY.

[" Aerial Photography." By Clarence Winchester and F. L. Wills, F.R.P.S., with an Introduction by Sir Alan Cobham, K.B.E., A.F.C. 236 pages, 90 pages of illustrations 9¾ in. by 7 in., index. Chapman and Hall. From THE AEROPLANE Book Department, 14, Bream's Buildings, E.C.4. 25s. net.]

The outstanding importance of Air Photography has been rightly emphasised both in the author's preface to " Aerial Photography " and in the foreword by Sir Alan Cobham. The latter describes Air Survey as being probably of greater importance to Britain than any other country in the World, a statement which cannot be denied when one considers the vast expanses of the Empire which yet remain unsurveyed. There seems little doubt that this branch of aviation is chiefly in the near future to provide our survey companies as well as the manufacturers of air photographic apparatus with much work of a remunerative nature.

The large contracts recently secured by British commercial companies must point to the conclusion that Air Survey is undoubtedly becoming increasingly useful and important. And knowledge of the subject, which is now unfortunately confined to the few, must be disseminated if the technical procedure involved is to keep pace with aircraft progress generally.

A comprehensive text-book on the subject of air photography would, for this purpose, prove of inestimable value, not only to pilots who propose to devote their activities to this branch of aviation, but also to the small band of photographers who are specialising, or are desirous of specialising, in the production of the actual photographs themselves.

It can hardly be said that this present volume meets this need, for unfortunately it contains, in common with many text-books on other subjects, little that is new and much that might, with advantage, have been omitted. On the other hand many matters which are merely referred to in passing might have been treated with advantage in a much more comprehensive manner.

The inclusion of the story of the private soldier who took a camera into the air in the early days of the war, contrary to regulations, and thus obtained photographs which convinced the Staff of the camera's utility of this form of reconnaissance work, points to a lamentable lack of historical knowledge of the subject on the part of the authors. It should now be a matter of fairly common knowledge that careful thought and no small amount of experimenting was given to this branch of aeronautics before the War, and that in addition to work with ordinary apparatus, a semi-automatic camera was designed and used with considerable success by the R.F.C. in 1913.

The book generally cannot be considered as a serious work of reference on a subject upon which much has been recently written both in this country and abroad. The technical information contained in its pages is meagre, and not always accurate, whilst some of the main principles involved in the production of successful air photographs are inadequately explained.

A small portion only of the book is devoted to the purely technical aspect of the subject, the remainder being mainly filled with descriptions of various makers' products. These descriptions form an interesting, though by no means complete, record, but it is to be regretted that passages have been quoted verbatim from foreign manufacturers' *brochures* in such a way as to lead one to the conclusion that the writers' knowledge of such apparatus is derived chiefly from this source, and not from any experience gained with the apparatus itself.

It must be admitted that any manufacturer is entitled to write in somewhat glowing terms of his own products. But independent descriptions of such apparatus couched in the same terms in a technical publication are liable to mislead the uninitiated person and cause him to form conclusions which may be totally inaccurate.

Some of the technical expressions used in the text are decidedly loose. An outstanding example being the statement that aerial photographic lenses are " of the fixed focus type." One gathers what the authors intend to apply by the use of this phrase, but the description is scarcely one which should be used in what purports to be a technical handbook.

Although a chapter is devoted in the book to aerial surveying and map-making, it can hardly be said that even the fringe of this most important part of the subject has been touched upon. One hesitates to suggest that any explanation making use of invalued mathematical formulæ is either necessary or desirable in a book of this type, but a more or less popular explanation of the principles involved in survey from the air would have added considerably to the interest of the volume. The reader is referred to the periodical reports of the Air Survey Committee for further information on the subject, sound advice to any serious student of air survey methods.

Stereoscopy, that most useful aid to the air surveyor and to the Service intelligence officer, fills but four pages of text and is treated in that superficial manner which characterises other portions of the book.

The photographs with which the volume is profusely illustrated have, apparently, been carefully chosen and are well produced on good paper. Many of these are excellent examples of the excellent photography carried out by Aerofilms Ltd., and the illustrations generally add considerable interest to what must otherwise be termed a somewhat unimportant work.

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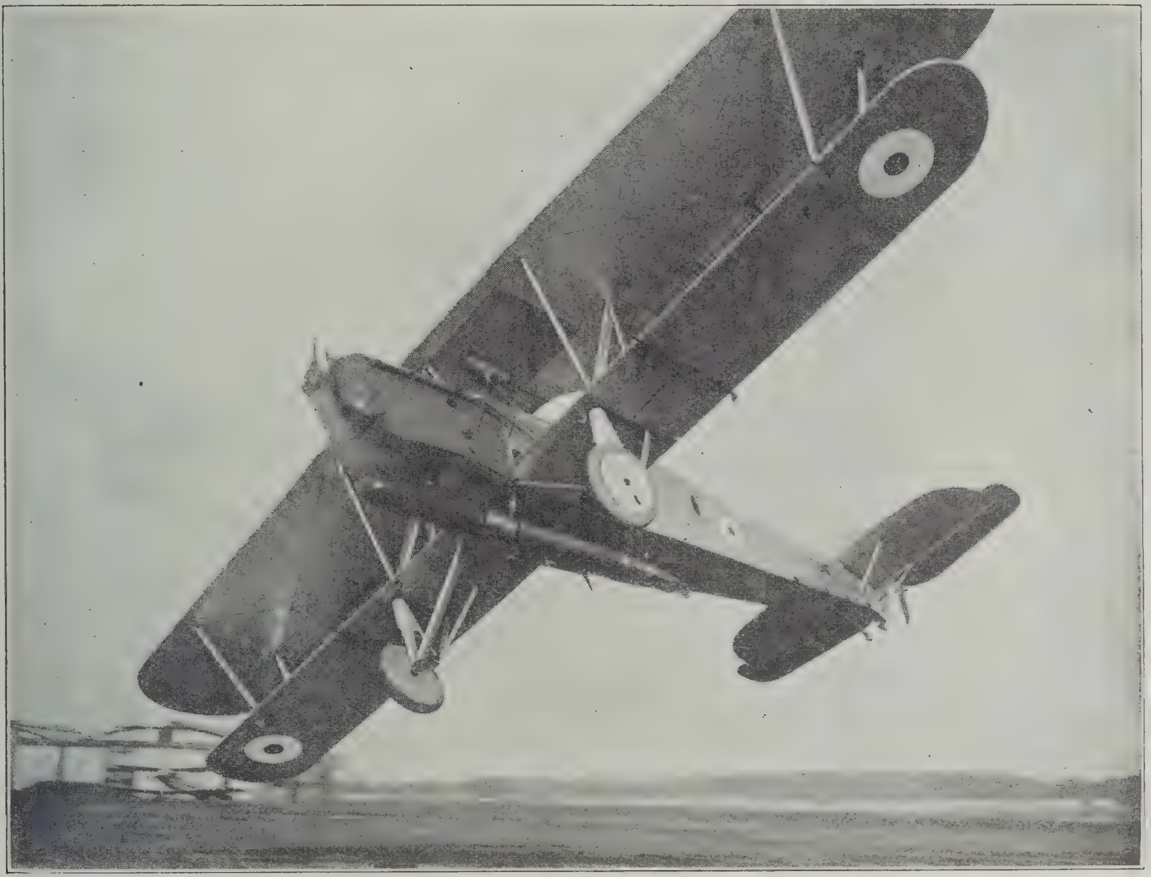

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THE NORFOLK AERIAL RALLY.

The Norfolk and Norwich Aero Club arranged a flying display at the Mousehold Aerodrome on May 30 in honour of the visit to Norwich of H.R.H. the Prince of Wales, K.G.

The Norfolk and Norwich Aero Club has been in existence just over a year and has made great strides. There are over 300 members, of whom about 150 are flying members. The Club owns a D.H. Moth (Cirrus Mark II) and an Avro Avian (Cirrus Mark II) and has a comfortable and well-equipped Club-house. They have also acquired an aerial camera.

The day's programme on May 30 opened with the inspection, by the Prince of Wales, of the Club-house and of the Club and visiting machines. In spite of the fact that it was a Wednesday and therefore hardly within the most elastic week-end a splendid muster of machines rallied in support of the Club. Apart from the Club's Moth and Avian and Boulton and Paul's gallant old P.9 and the historical D.H.53, which is now the property of Mr. F. Gough, the energetic Managing Director of the Club, there were a number of other Club and privately-owned machines and a strange assortment of R.A.F. aircraft. There was also a joy-riding Avro of uncertain age.

One does not pretend to give a complete list as some of the machines were like the shepherd's lamb, moving about so quickly they could not be counted, but those which stayed put long enough to be noted were the D.H. Company's slotted Moth (100 h.p. Gipsy engine), Mr. Broad up; two Moths from the London Club; an Air Taxis Moth; Flt. Lt. Soden's Moth, owner up; Capt. H. Balfour's slotted Moth, owner up; a Department of Civil Aviation Moth piloted alternately by Sir Sefton Brancker and Flt. Lt. J. I. T. Jones, R.A.F.

There were two Blackburn Bluebirds, one belonging to the Suffolk Club and the other lent by the Blackburn Company to Flt. Lt. J. S. Chick. One understands that the side-by-side seating in the Bluebird appealed to the Prince of Wales, who said, "Oh, how jolly!"

Flt. Lt. D. W. F. Bonham-Carter was on a Parnall Imp, and Mr. H. J. Penrose flew over on a Westland Widgeon. While admiring the Widgeon the Prince of Wales is alleged to have said that he was having a machine from the Westland Works, which seems to justify the rumour that the Service Bristol Fighter which is at present maintained by the R.A.F. for the use of His Royal Highness is shortly to be replaced by a Westland Wapiti.

The R.A.F. machines at the Display, in addition to the two Bristol Fighters from No. 24 (Communication) Squadron, which arrived from Northolt to take the Prince of Wales back to London, were another Bristol Fighter, a Lynx Avro, a Cirrus Moth and a D.H.9a. There was also a Westland Westbury and a Hawker Horsley, from Martlesham Heath presumably, and a Fairey Fawn emblazoned with the crest of No. 503 (Bombing) County of Lincoln Squadron, Special Reserve, R.A.F., from Waddington. His Royal Highness also had a look at the parts of the framework of R.101, which are being constructed by Boulton and Paul Ltd. in some of their sheds adjoining the aerodrome.

After the Prince of Wales had departed to fulfil the various civic engagements connected with his visit, the visitors were most hospitably entertained by the Club and the Display proper began. Mr. G. E. Lowdell, the Instructor of the Suffolk Club (of 440 yards' fame on the Uxbridge track), gave a hair-raising display of aerobatics on the Suffolk Club's Bluebird. This was followed by a balloon-bursting competition, won by Flt. Lt. Bonham-Carter, with Sq. Ldr. Noakes (not on the Horsley or the Westbury) second, and Mr. Lowdell third.

According to the programme the mock aerial fight which followed was "between a fast single-seater machine and a heavier aeroplane," but the combatants both looked suspiciously like Moths. Mr. Broad then flew the D.H. Co.'s slotted Moth to demonstrate exactly how absent-minded a Club member can be near the deck and still get away with it.

This brought things up to the time that the Prince of Wales was due to start for London and the two Bristol Fighters were started up. These machines are standard Service equipment except for large wind-screens in front of the passenger's cockpit. They have the new marking of the Communication Squadron, consisting of alternate black and red chevrons on the fin.

The Prince of Wales waited at the aerodrome to see a parachute jump by Mr. J. Tranum, a professional parachutist, before he left. His Royal Highness was fitted into his own parachute by Flt. Lt. Soden. The two Bristol Fighters, piloted by Flt. Lt. D. S. Don and Flg. Off. G. C. Stemp, took off in close formation.

According to the announcer the next item on the programme was a demonstration of crazy-flying by two members of the Norfolk and Norwich Club. The Aeroplane's Special Secret Service Department is, however, able to announce that the pilots were Sq. Ldr. N—— and Flg. Off. A——.

After this a Moth chased an Austin Seven all over the aerodrome, but failed to score a hit. Nor was the marksmanship in the Aerial Golf Competition anything to boast about; in fact the writer will draw a merciful veil over the result of Aerial Golf in Norfolk.

The show finished with the presentation of prizes by Mr. H. N. Holmes, to whose generosity from its beginning the Club owes so much.

Altogether it was a delightful day and everybody thoroughly enjoyed themselves. The only suggestion one has to offer is that on future occasions the machines are not lined up between the spectators and the aerodrome as they sometimes impeded the view of the low flying.

The Norfolk and Norwich Aero Club as a whole and the Display and Management Committees in particular are to be heartily congratulated on organising so excellent and enterprising a display.—C. M. McA.

ANY OFFERS?

A reader of The Aeroplane is desirous of partaking in the King's Cup Race. He is willing to pay the cost of entry and half the running expenses of a machine on condition that he is permitted to occupy the passenger's seat. Will anyone who can accommodate the above individual please communicate with this journal.

CANADA'S FIRST OFFICIAL CLUB MOTH.

On May 14 Mr. Bythell and Mr. Arden Smith took over at High River the first of the Moths given by the Department of National Defence to the organised flying clubs in Canada. This machine was destined for the Saskatoon Aero Club Ltd., and the pilots flew it to Saskatoon from High River, a distance of approximately 500 miles, in 6 hrs. 15 mins.

EAST ANGLIAN AVIATION.—The machines lined-up for their inspection by H.R.H. the Prince of Wales, K.G., on the occasion of his visit to the Norfolk and Norwich Aero Club. The first three machines on the left of the top picture belong to the Norfolk and Norwich Club, and the last three machines in the lower picture are, from the left, a Hawker Horsley, a Westland Westbury, and part of a Fairey Fawn.—(*"Aeroplane" photographs.*)

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THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: Harold Perrin, 3, Clifford Street, London, W.1.]

Report for week ending May 27.

Flying Time 36 hr. 15 min. *Instruction* 16 hr. 25 min. *Soloists* 19 hr. 50 min.

Report for week ending June 3.

Flying Time 38 hr. 25 min. *Instruction* 17 hr. 40 min. *Soloists* 20 hr. 45 min.

During the past week the following members passed the Flying Tests for Aviators' Certificates:—Messrs. E. R. Andrews, R. Ward, I. C. V. K. Watson, R. H. E. Sanders-Clark.

Monthly Return for May:—Total Flying Time, 488 flights, 192 hr. 15 min.; *Dual,* 202 flights, 84 hr. 45 min.; *Solo,* 177 flights, 83 hr.; *Passenger Flights,* 33 flights, 11 hr. 45 min.; *Test Flights,* 76 flights, 12 hr. 45 min.

Midland Air Pageant.—The Club will send a D.H. Moth to Castle Bromwich on June 9 to take part in the following events:—*Air League Challenge Cup—Pilot:* E. E. Stammers. *Midland Inter-Club Challenge Cup—Pilot:* G. H. Craig. *Midland Open Challenge Cup—Pilot:* F. R. Matthews.

Mr. N. H. Jones, on his own Moth, will also represent the London Aeroplane Club in the Air League and Midland Challenge Cups.

The Newcastle-upon-Tyne Aero Club.

[Sec.: J. T. Dodds, Cramlington Aerodrome, Northumberland.]

Report for week ending June 3.

Flying Time 60 hr. 40 min. *Instruction* 15 hr. 55 min. *"A" Pilots* 35 hr. 40 min. *Passengers* 7 hr. 10 min. *Tests* 1 hr. 55 min. *Instruction.—With Mr. Parkinson*—Capt. Lynden Bell, Mrs. Kish, Miss Klyver, Messrs. Kendrick, Cochrane Carr, George, R. G. Lawson, Temple, Nicholls, Fairless, Hayton, Welch, Griffiths, Swann, L. B. Dickinson, V. Heaton. *Secondary Dual.*—Miss Leathart, Messrs. Robertson, Turnbull, Runciman, Lloyd Browne. *"A" Pilots.*—Miss Leathart, Mrs. Heslop, Messrs. Heppell, Lloyd Browne, Davey, Runciman, Turnbull, H. Ellis, White, R. N. Thompson, C. Thompson, Robertson, Irving, Wilson, Stawart, Phillips, N. S. Todd, A. Bell, Dr. Alderson and Dr. Dixon. *Passengers carried.*—16.

A new record for one day's total flying was established on Sunday, when 20½ hours was completed and the week's total beats all previous records for the Club.

Mr. Parkinson and Mr. Turnbull will take part in the Midland Club's Meeting at Castle Bromwich on Saturday, flying the Club's Moth PT, and Miss Leathart has entered her Grasshopper AIN in the Open Handicap.

Miss Leathart has put in an hour's flying on the Grasshopper, the first since its C. of A. overhaul.

Mr. Wallace, on Moth PM, called for lunch and petrol on Thursday on his way South from Scotland, but owing to fog he was unable to proceed on the journey until Friday.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. J. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending June 2.

Flying Time 37 hr. 40 min. *Instruction* 13 hr. 50 min. *Soloists* 19 hr. 45 min. *Passengers* 4 hr. 5 min. *Instruction.—With Mr. Beck*—Messrs. Batcock, Brown, Mrs. R. Blackburn, Messrs. Clayton, Daly, Miss Ellison, Messrs. Fitton, Gill, R. Lax, Lupton, Ostler, Reynolds, Roberts, Rowley, A. Senior, Shires, Sugden, Woolley. *Soloists.*—Messrs. D. Atcherley, A. Crowther, Dick, Reynolds, Woolley. *"A" Pilots.*—Messrs. R. Atcherley, Birch, Clayton, H. Crowther, Dawson, Ellison, Humpheries, R. Lax, Lister, Thomson, Wood. *Passengers carried.*—14.

Mr. Woolley, after many years' absence from flying, went solo last Sunday and put up a creditable performance, and Mr. Reynolds, who only joined the Club three weeks ago, went solo on June 1 and put up a remarkably fine show.

We take pleasure in congratulating two members, Mr. Stewart Dick and Miss Marjorie Crawford, on their engagement.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending May 26.

Flying Time 27 hr. 15 min. *Instruction.—With Flt. Lt. Rose, D.F.C., and Mr. W. H. Sutcliffe*—Messrs. E. P. Lane, N. Khatri, W. M. Morris, M. Turner, J. B. Briggs, W. Swann, J. Cobb, A. E. Coltman, S. H. Smith, T. H. Drury, R. C. Baxter, S. G. Hall, H. Beamish, S. E. C. Hill, J. Rowley, G. Savage, Capt. H. G. Tower. *Soloists.*—Messrs. E. P. Lane, S. C. Hall, R. D. Bednell, W. M. Morris, C. W. Fellowes, J. Rowley, E. J. Brighton, R. L. Jackson, H. Tipper, G. Robson, S. H. Smith. *Passengers carried.*—9.

Report for week ending June 2.

Flying Time 30 hr. 11 min. *Instruction.—With Flt. Lt. Rose, D.F.C., and Mr. Sutcliffe*—Messrs. E. P. Lane, J. Cobb, G. E. C. Hill, G. P. Haylock, G. C. Jones, E. J. Brighton, R. D. Bednell, S. Duckitt, G. Robson, S. H. Smith, M. A. Murtagh, S. G. Hall, J. B. Briggs, A. E. Coltman, G. Brinton, T. H. Drury, M. Turner, R. C. Baxter, H. Beamish, E. D. Wynn, N. Khatri, S. Nesbit, Capt. J. C. Chaytor. *Soloists.*—Messrs. E. P. Lane, J. Rowley, A. Ellison, R. D. Bednell, G. Robson, S. G. Hall, W. M. Morris, E. J. Brighton, R. L. Jackson, S. H. Smith, E. D. Wynn, H. Tipper, W. Swann. *Passengers carried.*—13.

The total flying time for May was 119 hr. 4 min.

The Hampshire Aeroplane Club.

[Sec.: A. J. Harrington, The Aerodrome, Hamble.]

Report for week ending June 3.

Flying Time 20 hr. 10 min. *Instruction* 3 hr. 40 min. *"A" Pilots* 7 hr. 27 min. *Soloists* 3 hr. 5 min. *Passengers Flights* 5 hr. 25 min. *Tests* 35 min. *Instruction.—With Flt. Lt. Swoffer.*—9. *Passengers carried.*—13. *"A" Pilots.*—10. *Soloists.*—5.

Miss Grace has carried out a first successful solo, and also Mr. Wroughton. Messrs. Tillard, Collier and Richardson have completed their tests for their "A" Licences; this brings our number of "A" Pilot members to 38.

We are still breaking records; last month with a total of 200 hr., and Sunday with a total of 18 hr. 50 min.

Total Flying Time for the month of May 200 hr. 5 min. *Instruction* 73 hr. 30 min. *"A" Pilots* 55 hr. 20 min. *Soloists* 27 hr. *Passenger Flight* 36 hr. *Instructors' Tests and Pageant Flying* 8 hr. 15 min.

The Norfolk and Norwich Aero Club.

[Manager: F. Gough, The Aerodrome, Sprowston.]

Report for week ending June 3.

Flying Time 22 hr. 30 min. *Instruction.—With Mr. Young*—Messrs.

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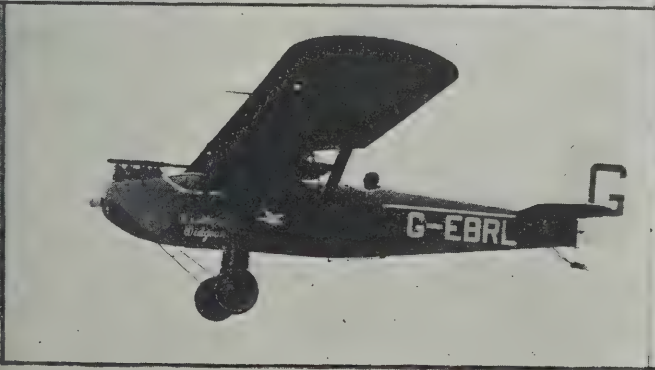

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May 30.—Thousands of people thronged the aerodrome to greet His Royal Highness the Prince of Wales. The Prince was received by our Chairman, Capt. A. A. Rice, M.C., and several of the Directors were presented.

In the annals of the Club this will go down as the Red Letter Day and all the members appreciate the great honour to the Club, and it is hoped that it will not be the last occasion on which His Royal Highness will grace the Club with a visit.

[*The flying is described elsewhere by C. M. McA.*]

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending May 26.

Flying Time 12 hr. 45 min. *Instruction* 4 hr. 25 min. *"A" and "B" Pilots* 50 min. *Soloists* 35 min. *Passengers Flights* 3 hr. 5 min. *Tests* 10 min. *Ferrying Machines* 3 hr. 45 min.

Report for week ending June 2.

Flying Time 11 hr. 55 min. *Instruction* 2 hr. 40 min. *"A" and "B" Pilots* 1 hr. 5 min. *Soloists* 10 min. *Flying at Hamble and Norwich* 4 hr. 15 min.

The two weeks now under review have witnessed a period of much disorganisation; what with preparation for Hamble, the meeting itself, followed by the Norwich Dislay. Now we are faced with the Midland Air Pageant.

We wish to tender our thanks to Hampshire and Norfolk for the very good time they gave us at their meetings, and we hope to return their hospitality in the future.

Hamble and Norwich have already been fully reported and therefore there is no necessity to refer to it here. We were naturally pleased with Mr. Lowdell and the Bluebird for being the only individual pilot and machine to get into all three finals at Hamble. Also we were much gratified that H.R.H. The Prince of Wales was so interested in our Bluebird at Norwich; that Dr. Sleigh, our Chairman, won second prize in aerial golf, and Mr. Lowdell third in balloon bursting. There are signs that people are beginning to realise the advantages of side-by-side seating, as is standard in our machines.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending June 2.

Flying Time 14 hr. *Instruction* 5 hr. 10 min. *Passengers carried.*—3. *Cross-Country Flights* 7 hr. 5 min. *Instruction.—With Mr. Bartlett*—Messrs. R. S. W. Clarke, Hughes, Peters, Lynas, Singh and Button. *With Mr. Tratman*—Messrs. Singh and Button.

Unpleasantly strong winds in the latter part of the week prevented much flying. On the 27th Mr. Downes-Shaw with Mr. Bartlett flew in G-EBTV to Hamble for the Hampshire Pageant, returning on the 29th. On the 31st Mr. Hall with Mr. Bartlett flew to Plymouth and back, experiencing fairly rough weather.

Cinque Ports Flying Club.

[Hon. Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

The Club officially began operations on Friday, the 25th instant, with Flg. Off. I. N. Colin Clarke, D.S.C., R.A.F.O., as Pilot Instructor. We were fortunate in the weather at the week-end, and managed to put in 16 hr. 35 min. with one machine. Fourteen pupils were under instruction during the week-end, including two lady members.

On Monday evening Mr. Clarke flew Mr. Maurice Braddell, who is a keen member of the Club, from Lympne to Croydon, in the Club Moth, to enable him to put in some instruction and to keep his appointment to broadcast from 2 LO on Monday night.

There are still vacancies for additional members, and the capital of the Company is not yet fully subscribed. Anyone wishing for particulars should apply to the Hon. Sec., 114, High Street, Hythe.

Report for May 25 to 28 inclusive.

Flying Time 16 hr. 35 min. *Instruction.—With Flg. Off. I. N. Colin Clarke*—Lt. Cdr. Gubbins, R.N., Messrs. Story, Douglas, Edgson Wright, Capt. Took, Messrs. R. Dallas Brett, Evernden, Miss Tagart, Cmdt. Mary Allen, Messrs. Wood, Maurice Braddell, Faraday, Twaites, A. Dallas Brett *Passengers.—With Flg. Off. Clarke.*—4. *Test Flights.*—20 min.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending June 3.

Flying Time 72 hr. 30 min. *Instruction.—Dual,* 22 min. 15 min.; *Solo,* 27 hr. 5 min. *Other Flying* 23 hr. 10 min.

Flying was curtailed to a great extent owing to the Whitsun holidays, when the School was closed down for several days.

Seven new Moths were tested and the new De Havilland Hound with a Jupiter engine also made its initial flight successfully.

The Henderson Flying School.

[Managing Director: Lt.-Col. G. L. P. Henderson, M.C., A.F.C.]

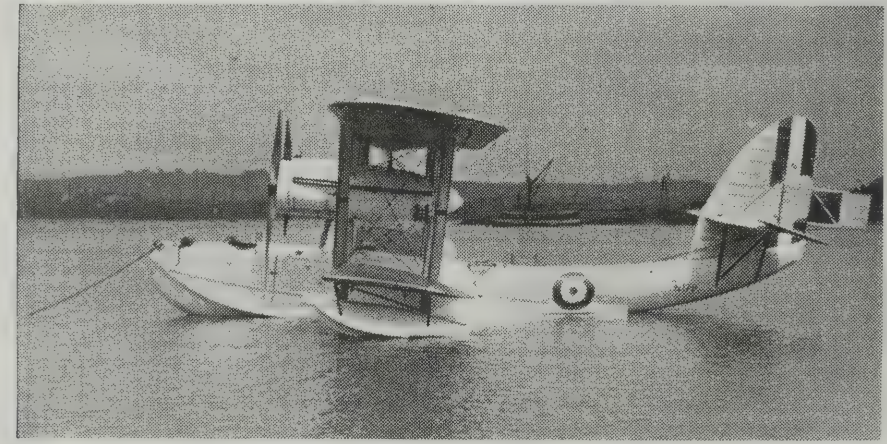
Report for week ending May 31.

Flying Time 61 hr. 35 min. *Instruction.—With Col. G. L. P. Henderson*—Messrs. Hill, Robles, Moss, Dr. Forsyth, Mr. Matos. *With Mr. Davis*—Miss Kidstone, Messrs. Moss, Oliver, Carlos, Robles, Crabtree, Payne, Burns, Murray-Philipson, Dr. Wall, Messrs. Grierson, Oldmeadow, Allen. *Dual.—With Mr. Davenport*—Messrs. Brooks, Anderson. *Soloists.*—Messrs. Oliver, Allen, Barclay, Hughes, Crabtree, Carlos, Hill, Grierson.

Messrs. Barclay and Patton-Bethune have passed all their tests for their Air Ministry "B" Licence and Mr. Allen has only to do a cross-country flight to complete his tests.

Two hundred passengers were carried at Hamble by Col. Henderson and Mr. Davenport, and Mr. John Tranum, the World-famous Parachutist, was dropped from one of our machines. Capt. Davies carried 243 passengers at Runnymede during the week-end.

New pupils are enlisting every day and enthusiasm is still at fever-heat.



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COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 9; Monday, 25; Tuesday, 35; Wednesday, 31; Thursday, 33; Friday, 35; Saturday, 40.

Imperial Airways Ltd.:
London — Paris — Zurich; London — Ostend — Brusels — Cologne: Machines 87, passengers 618; freight 16 tons.
Air Union:
Paris—London: Machines 48, passengers, 241, freight 14½ tons.
K.L.M.
Amsterdam—Rotterdam—London: Machines 25, passengers 148, freight 8 tons.
Sabena:
Brussels—London: Machines 12, passengers 47, freight 1½ tons.
Deutsche Lufthansa AG.:
Amsterdam—London: Machines 26, passengers 40.
Private:
Machines 10, passengers 17.

Total number of trips by British Machines, 97, carrying 635 passengers. Foreign Machines, 111, carrying 476 passengers.

COMPARATIVE FIGURES.

Week ending June 2.
Machines, 208; Passengers, 1,111; Crews, 387; Total personnel, 1,498.
Corresponding week, 1927:
Machines, 124; Passengers, 888; Crews, 228; Total personnel, 1,116
Corresponding week, 1926:
Machines, 138; Passengers, 697; Crews, 172; Total personnel, 869.
Corresponding week, 1925:
Machines, 150; Passengers, 614; Crews, 191; Total personnel, 805.
Corresponding week, 1924:
Machines, 117; Passengers, 372; Crews, 183; Total personnel, 555.
Corresponding week, 1923:
Machines, 166; Passengers, 345; Crews, 171; Total personnel, 516.
Corresponding week, 1922:
Machines, 134; Passengers, 258; Crews, 175; Total personnel, 432.
Corresponding week, 1921:
Machines, 97; Passengers, 299; Crews, 111; Total personnel, 410.
Corresponding week, 1920:
Machines, 97; Passengers, 211; Crews, 111; Total personnel, 322.

Croydon Notes.

Mr. Drew, who has been seconded by Imperial Airways for duty as Mr. Lowenstein's private pilot, has now returned from his visit to the United States where he flew a Fokker with three Whirlwind engines for a total of about 50 hours. He has brought with him a high opinion of American weather, a less high opinion of the average American aerodrome, and no opinion at all of American maps. From his experiences most of these would seem to have been drawn before any but the oldest American towns were built, and at a time when main-line railways were mostly single tracks.

The new three-engined Fokker which Mr. Drew is to fly in Europe for his temporary employer arrived at Croydon last week bearing the registration H-NAEK. It now carries G-EBYI instead. It would be interesting to know whether this and one or two previous examples of Fokker machines which have received British registration indicates that the Department of Civil Aviation will now grant British Certificates of Airworthiness to any reasonably well-proved type of foreign aircraft, or whether very special concessions have been made in the few cases of this kind which have already occurred.

Naturally the easy naturalisation of foreign-built aircraft will fail to please some members of the British manufacturing industry, but considering how divergent are the opinions held in this country as to the superior performance and reliability of British aircraft, and the claims made by foreign constructors for some of their own machines, it will certainly be interesting and constructive to find out precisely how representative samples of foreign civil machines behave when handled and maintained by British pilots and ground staffs.

The Vickers Vanguard, which belongs to the Department of Civil Aviation, has now been fitted with brakes on the main wheels and a wheel in place of a tail skid, and is being run in service by Imperial Airways to test the value of this equipment.

The brakes are of the internal expanding type, working in drums entirely contained within the usual disc fairing, and operated hydraulically from the pilot's seat. The brakes and operating gear are it is understood of Vickers make and design, and the wheels were specially built by Palmer Tyre Ltd.

After a week's service such reports as are current at Croydon are uniformly favourable and everybody is wondering why wheel-brakes for aeroplanes have not for long been standard equipment.

The Vanguard's take-off is improved, thanks to the tail wheel, and the run after landing can be reduced to something like 100 yards in a calm.

Mr. Van Lear Black returned to Croydon on May 30 after a non-stop flight of some seven hours from Marseilles. In spite of the unfortunate interruption of his intended flight to Cape Town he is reported to have lost none of his faith in the value of air transport.

The lady who, as was reported some weeks ago—made inquiries recently concerning the discount which could be given her on sixty tickets between Croydon and a Continental airport, did get a satisfactory offer and has bought her sixty tickets.

AIR SURVEY OPERATIONS.

The Aircraft Operating Company's South American air survey expedition, consisting of some 16 Europeans, under the leadership of Colonel T. T. Behrens, is now *en route* for Rio de Janeiro, where the company has secured an important contract to carry out a survey of the city and the Federal District by a combination of ground survey methods assisted by aerial photography.

Two aircraft will be used for the survey—a Vickers Vendace seaplane (Nimbus engine) and a Moth seaplane (Cirrus engine), fitted with Handley Page slots. In addition to this Eagle cameras will be used for taking the photographs. This equipment, together with the latest type of surveying and photographic instruments, will be dispatched on June 6, and Captain S. H. Holland, who is the chief pilot to the expedition, will be sailing on the same date. It will be recalled that the Aircraft Operating Company secured this contract in the face of powerful international competition.

The expedition represents the latest thing in scientific equipment, and full advantage has been taken in the organisation of the expedition of the valuable experience secured by the company in their air surveys in Rhodesia, and also in the revision work which they made for the Ordnance Survey in this country.

News has also been received that the company's Middle-East Expedition is now at Baghdad, and work is about to start on the air survey contract that has been secured with the 'Iraq Government. Major Cochran-Patrick is at present at Cairo, having made a remarkable journey from Bulawayo by motor-car and steamer, and he is about to leave for Baghdad by air.

It is the policy of the company to establish these three expeditions permanently. The South African expedition, which was originally taken out to Africa by Major Cochran-Patrick, is now under the leadership of Major R. A. Logan, and arrangements are being made to establish a permanent base at Bulawayo, and the company propose to erect steel hangars there, providing that satisfactory arrangements can be made with the Government of Southern Rhodesia. The Middle-East expedition, on the completion of the 'Iraq survey, will probably be divided into two expeditions, one of which it is hoped to establish in North-East Africa, and the other will be used for air survey work in India and the Middle-East. The company are also hoping to establish a further air survey unit on the West Coast of Africa.

In order to cope with the increased work that these expeditions will involve at home, the company have just purchased a modern daylight factory at Hendon, which they are fitting up as photographic laboratories and drawing offices. The building when completed will be taken over by their subsidiary company, Aerofilms Ltd.

ANOTHER EMIGRANT.

The latest addition to the flying personnel of Fairchild Aviation Ltd., at Grand 'Mere, Quebec, is Mr. C. R. Troup, late of No. 39 Squadron, R.A.F., who arrived in Canada on May 20 to take up duties as a pilot for that firm.

Mr. Troup has a high reputation as a skilful and steady pilot and should contribute largely to the valuable work which the Fairchild Company are doing.

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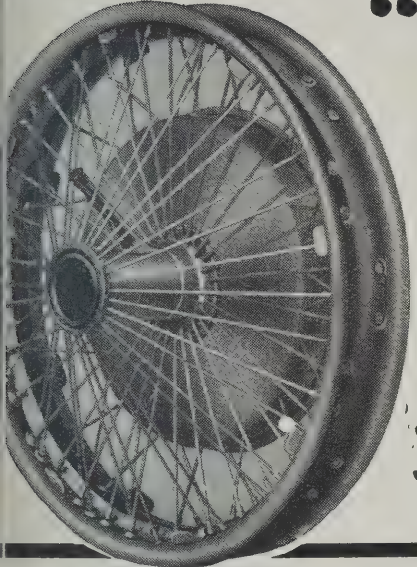

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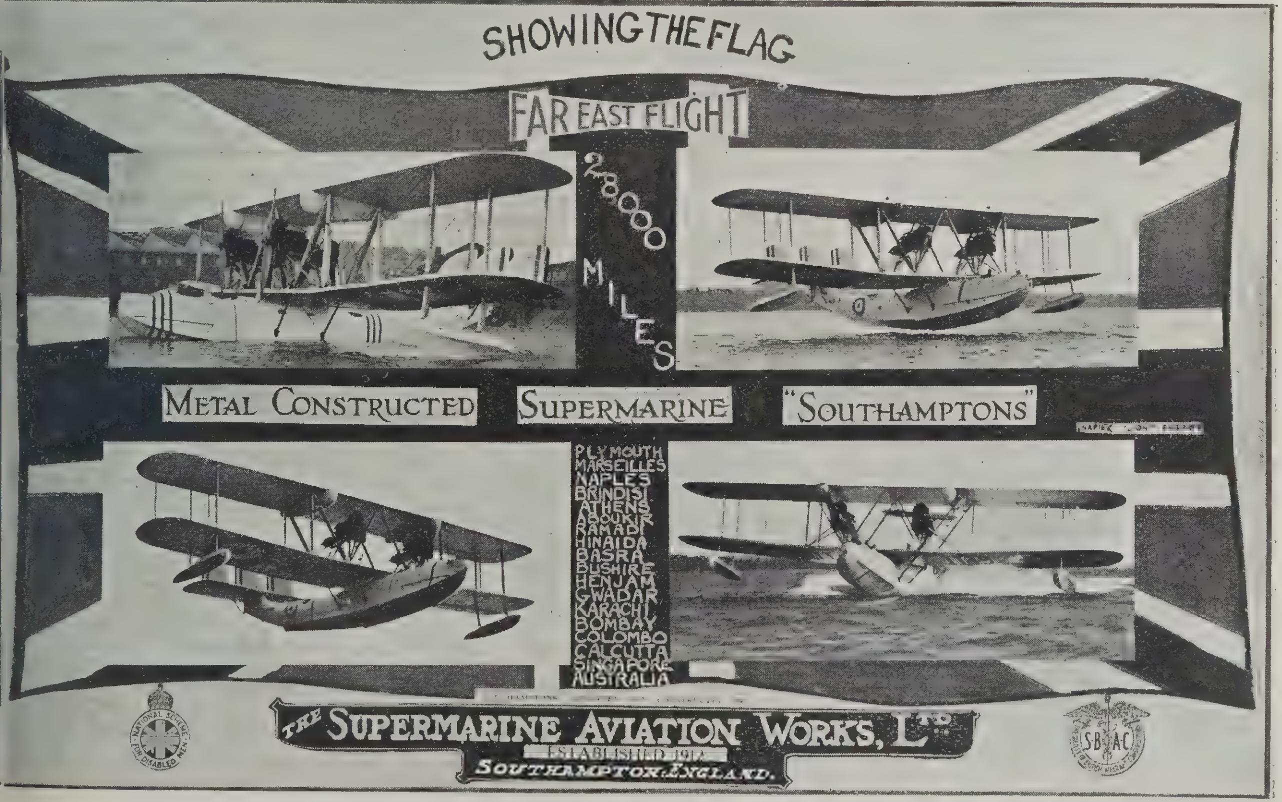

CANADIAN AIRWAYS.

British firms who are anxious to do business in Canada and who desire to supplement the effect of publicity which they get from THE AEROPLANE, should take note that *Aircraft and Airways* of Toronto has started what one hopes will be a flourishing career in the Dominions.

Aircraft and Airways is represented in London by Mr. J. H. Negin, of Excel House, Whitcomb Street, W.C.2, Telephone Regent 3706. Communications sent to him will receive due attention when forwarded by him to Toronto and any information about *Aircraft and Airways* can be got from him without having to wait for a reply from Toronto.

PERSONAL NOTICES.

DEATHS.

COOPER.—On May 29, as the result of an aeroplane accident at Weymouth, Arthur Gabbetis Cooper, Flg. Off., R.A.F.O., late of Teddington, beloved son of Mr. and Mrs. Cooper, of West Lodge, Buckhurst Hill.

Mr. Cooper was born at Harrow in 1898 and joined the R.F.C. in 1917. He was demobilised in 1919 and joined the Reserve of Air Force Officers in March, 1924. He had been engaged in passenger-carrying in an Avro from Lodmoor Aerodrome and was flying at Dorchester during the week before the accident.

An inquest was held at Weymouth on May 31 and a verdict of accidental death was returned.

Bernard Carpenter, the mechanic, who is still in hospital, in a statement taken from him by the Coroner, said that when the machine was about 1,500 ft. up Cooper signalled to him to get down on the floor as he was going to "stunt." Neither of them was strapped in. The pilot did the loop, and they climbed again and did another successfully. They climbed again for a moment and then dived with the engine full on. Cooper pulled the machine up as though for a loop, and then shut the engine off. The machine stalled, the left wing went down, and the nose dropped, and they went over to the right side and began to spin. After about five spins the machine was pulled out of it, but struck the water. Throughout the flight the machine was flying perfectly. He had been with Cooper for about four weeks. He was a very sound pilot.

FENWICK.—On May 26, at Baghdad, the result of a motor accident, William Longstaffe Fenwick, Flt. Lt., R.A.F., aged 32, the dearly loved younger son of Mr. and Mrs. T. C. Fenwick, of 161, Sutherland Avenue, London, W.9, and Aldeburgh, Suffolk.

Flt. Lt. W. L. Fenwick served with distinction in the R.A.F. during the War 1914-18 and after the Armistice was posted to the R.A.F. Depot, Uxbridge. In January, 1922, he was posted to Martlesham Heath and in April, 1922, he was transferred to No. 2 Squadron, then at Digby. He was promoted to be Flight Lieutenant in June, 1922, and after a refresher course at Kenley was posted to No. 1 F.T.S., Netheravon, in September, 1922, as a Flying Instructor. While at Netheravon he played full-back for the Station Rugby Football team which won the R.A.F. Rugby Cup in 1923 and 1924. In November, 1924, he was appointed to 'Iraq for Air Staff (Armoured Car) duties at Air H.Q., Baghdad, and in January, 1925, he was posted to No. 5 Armoured Car Company, which was absorbed into the Armoured Car Wing, Hinaidi, in April, 1927. A recent reference to Flt. Lt. Fenwick occurred in a letter from a correspondent in 'Iraq, which appeared in THE AEROPLANE of April 11.

FORSTER.—On May 26, at Baghdad, the result of a motor accident, Edward Beresford Forster, Flg. Off., R.A.F.

Mr. Forster was educated at Christ's Hospital and entered the R.A.F. Cadet College at Cranwell in 1920, being one of the first entry on the formation of the College. He distinguished himself as an athlete and played wing three-quarter in the Cadet College Rugby team and was vice-Captain of the Cricket. He also won the 120 yards hurdles at Cranwell for two years in succession and was second in that race at the R.A.F. Championship Sports in 1922. He was also a member of the Cranwell Fencing team and did well in the Long Jump. He passed out of Cranwell in August, 1922 and was posted to the School of Army Co-operation at Old Sarum. From there he went to No. 29 (Fighter) Squadron at Duxford after a course at the C.F.S. In July, 1924, he was posted to No. 24 (Communication) Squadron, then at Kenley, and in September, 1925, he was posted to No. 55 (Bombing) Squadron in 'Iraq. In December, 1926, he was transferred to No. 30 (Bombing) Squadron. In March, 1928, he was posted to H.Q., 'Iraq, for disposal, and the fact that at the time of the accident he was attached to No. 84 (Bombing) Squadron was probably on account of the recent trouble in the Akwan area as his tour of service in 'Iraq would normally have ended.

MARRIAGE.

PEARSON—POTTER.—The marriage of Mr. John MacLaren Pearson, late Cameronians and Royal Flying Corps, second son of the late Mr. C. J. B. Pearson and Mrs. Pearson, and Miss Bettine Marie Hamilton Potter, elder daughter of Major and Mrs. Cyril Potter, of Blakes, Lymington, took place on June 2 at St. John's Church, Boldre.

FORTHCOMING MARRIAGE.

WOODIN—BYGOTT.—The marriage arranged between Mr. John Horton Woodin, R.A.F., and Mrs. H. C. Bygott will take place quietly at Holy Trinity, Brompton, on June 12, at 11 o'clock. There will be no reception, but all friends will be welcomed at the church.

BIRTHS.

BONHAM-CARTER.—On May 28, at Worthington Cottage, South Farnborough, Hants, to Joyce (*née* Palmer), wife of Flt. Lt. D. W. F. Bonham-Carter—a son.

DAVIES.—On May 18, at Wynyard House, 30, Palace Road, London, S.W.2, to Dorothea, wife of Flg. Off. Hugh N. Davies, R.A.F.—a son.

HICKS.—On June 2, at The Pennings, Wendover, to the wife of Wing Cdr. W. C. Hicks, R.A.F.—a son.

HOLLICK-KENYON.—On May 26, at Ivy House, Devizes, Wilts, to Mary (*née* Manning), wife of Herbert Hollick-Kenyon (late R.A.F.)—a son.

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THE AEROPLANE—JUNE 13, 1928.

AERO SHOWS ABROAD.

THE AEROPLANE

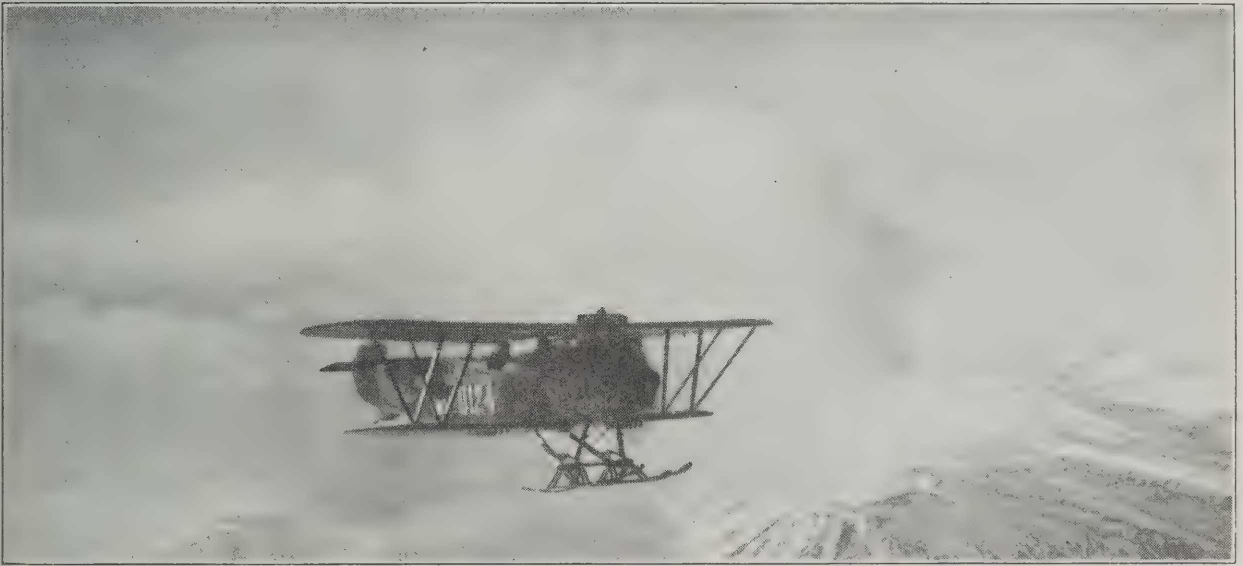
INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 24. SIXPENCE WEEKLY. [Registered at the G.P.O. as a Newspaper.

JUN 2 6 1928
UNIVERSITY OF

"WHERE THE NORTHERN LIGHTS COME DOWN O' NIGHTS
TO DANCE WITH THE HOUSELESS SNOW."—*(Kipling.)*



A FAST LAP:—A Phœnix Dronten two-seat reconnaissance biplane of the Swedish Royal Air Force flying over Kebnekajse, the highest mountain in Lapland, Sweden, north of the Arctic Circle.

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THE AEROPLANE

Incorporating
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VOL. XXXIV No. 24.

The Editorial Offices of "The Aeroplane" are at 175 Piccadilly, London. W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months 30s.
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ON FOREIGN TRADE AND AERO SHOWS.

ruly the Anglo-Saxon is no kind of a co-operator. All
story shows it. He is extraordinarily good under disci-
ne, and he will combine to a certain extent in self-
fence. But he will not co-operate on equal terms with his
uals. Hengist and Horsa made hay of Britain. They did
t make it into a Limited Liability Company.

ssentially the Anglo-Saxon is an individualist. After the
xons had laid waste most of Roman Britain they estab-
hed themselves in farms by families, but they did prac-
ally no town building. And even their villages were
her houses close together than real communities. This
y account for the fact that while individual English busi-
ss men may do so well, English trades do badly owing to
k of co-operation.

he English merchant venturers of the past were essen-
lly individualists,—besides mostly being pirates on the
gh Seas. They never made any attempt at forming vast
nmercial combines as did the great German Hanseatic
ague of the Middle Ages.

When any particular British trade does become a commer-
l proposition then the Jews come in on the financial side.
d then they form mergers or trusts or combines.

Jp to the present the Aircraft Industry has not been
cessful enough to lure any Jews into it. One probably
ows the Aircraft Industry as intimately as does anybody,
l one does not know of a single Jew in it. There may
some very young Jews in quite minor positions, but there
certainly no Jews in anything like responsible jobs.

During the false boom of the War 1914-18 there were quite
lot of Jews in the Aircraft Industry, making very good
ney out of it. But they all quit as soon as the Govern-
nt contracts were cut after the Armistice, and went to
ke money in some other line of business. One wishes
t the Jews would come back to the Aircraft Industry, for
t would be the proof of its being a commercial undertaking.

Meantime the Aircraft Industry consists of roughly twenty manufacturing firms, each controlled by very English individualists. Some of them are doing remarkably good business as individuals. Some of them are not doing quite so well. But none of the firms in the Industry to-day are doing really badly. At any rate, all the men at the top seem to drive quite handsome automobiles and to be very well contented with their lot. And after all, that being so, who shall blame them for not combining and making more money for themselves and each other?

THE NEED FOR COMBINATION.

At the same time it is a pity that there is not more combination and co-operation between firms with the object of capturing trade in the British Dominions Overseas and in foreign countries before our relatives in the United States get too firm a hold. Sad to say, some manufacturers do not seem to care whether they get foreign trade or not. At least one manufacturer is reported on good authority to have said, "Why should I bother about foreign trade? The Air Ministry keeps me busy with orders, so why worry?"

If that were the attitude of all British manufacturers, then that individual would be right who said that the curse of the British Aircraft Industry was the Air Ministry, because it kept the factories busy on orders for war machines when, if they were left without any orders for the R.A.F., they would have to go out after foreign trade or die. Like Civil Aviation, the Trade would in the end be better off if it had to fly by itself.

Air Ministry orders may be a very good thing for the individual manufacturer, but they are no use to the Country as a whole. The money that pays for them comes out of the pocket of the Taxpayer, whereas the money for foreign orders, and for orders from the British Dominions, brings money into the Country.

THE WINNER.—Mr. Neville Stack, winner of the Open Handicap at the Midland Air Pageant, on the white and red Moth X (Cirrus), G-EBUF, belonging to A.D.C. Aircraft Ltd.—(*"Aeroplane" photograph.*)

FOREIGN TRADE.

Certain British aircraft manufacturers are doing very good trade abroad. But they are doing it entirely on their own initiative. Some are getting business because they happen to have specialised on a particular type of aircraft for which there is really a demand without any competition by foreign manufacturers. Others, though faced by keen foreign competition, are getting the business by sheer hard pushing backed by the fact that the quality of their aircraft is so high that foreign buyers will pay our prices even against the under-cutting and graft of the aircraft constructors of other nations.

The getting of foreign business under these individualistic conditions must be enormously expensive. Some firms must be spending anything between £10,000 and £25,000 a year apiece each in getting their foreign business. And that money is being spent in foreign countries, so it represents just that much money lost in this country.

Surely it should be possible for half-a-dozen big firms to combine and form some sort of a selling syndicate in which each would be prepared to spend say £10,000 a year in pushing foreign trade? £60,000 spent in one block in pushing half-a-dozen different makes of British aircraft would certainly have a more immediate shock effect on the foreign markets than would two or three times the amount sprinkled over those markets by half-a-dozen different firms, each competing with the other as well as with foreign manufacturers.

Competition is always good for trade. But we have quite enough competition from foreign makers to provide all we need to keep the representatives abroad of such a syndicate pretty keen on their job.

True, we have the Society of British Aircraft Constructors, which is the representative body of the British Aircraft Industry, and does extremely good work so far as its activities go. And the S.B.A.C. has in its secretary, Mr. Charles V. Allen, quite one of the keenest and most able officials one has met in any of the many trades with which one has been intimate.

But the S.B.A.C. is not a selling organisation. It is rather a Trade Protection Association. Its members are all on excellent personal terms with one another. In fact, a meeting of the S.B.A.C. is more like a very pleasant tea-party than a gathering of keenly competing business men. Which makes all the more extraordinary the fact that no offensive organisation, either of the S.B.A.C. as a whole or of a few members thereof, has ever been formed to capture foreign markets.

These reflections are prompted by the fact that a great International Exposition of Aircraft, War and Peace, is to be held in Paris in July, and that an equally important Show of Civil Aircraft is to be held in Berlin in October. And at neither of these Exhibitions are British aircraft likely to be at all adequately represented.

THE PARIS SHOW.

The list of firms which have definitely arranged to exhibit at the Paris Show has recently been published. In this list there are 18 French aircraft firms and 11 French engine firms. In it also, a fact which will surprise a good many people, are nine German aircraft firms and three German motor firms. Also, there are three Italian aircraft to be shown and three Italian motors. Furthermore, there are two Czechoslovak aircraft firms and two Czechoslovak engines.

The British Aircraft Industry will be represented by two motor firms, and one aircraft. Considering the importance of the British Empire and the magnitude of the British Aircraft Industry this representation does not seem adequate.

One gathers that the S.B.A.C. as an association did negotiate with the *Chambre Syndicale*, which runs the Paris Show, with a view to booking a certain amount of space in which British aircraft would be exhibited. Apparently the *Chambre Syndicale* refused to let space to the British Aircraft Industry as a whole, and said, quite reasonably, that if any British firms wanted to exhibit they were quite at liberty to buy space on the same terms as the French firms, —without, presumably, being allowed the special discount on the price of space which is given to the French firms which are themselves members of the *Chambre Syndicale*.

The Italian exhibit is a co-operative affair in a way. It is as a matter of fact an official exhibit of the Italian Government, which puts into it what are considered to be the best Italian aircraft. Possibly, if our Air Ministry had thought it worth while to put up an Air Ministry exhibit in the Paris Show the *Chambre Syndicale* would have allotted space as a matter of courtesy to the British Government.

If such a thing had been done, then of course the Air Ministry could have exhibited selected British aircraft in the space allotted to them. But one would have been very sorry for the unfortunate officials of the Department of the Supply and Research who undertook the invidious task of selecting which machines were to be shown and which were not.

Though only one British aircraft firm has considered worth while the expense of exhibiting at the Paris Show, one imagines that every British aircraft firm would have been bitterly offended if a sample of its aircraft had been omitted from an Air Ministry exhibit at the same show. Therefore one has every sympathy with the Air Ministry in not tackling such a task as putting up a representative exhibit of British aircraft in Paris.

The Italian Government is not in such a difficult position. Our good friend General Balbo, representing The Great Mussolini, is practically the dictator of the Italian Aircraft Industry. Consequently he, or his technical advisors, can show just what they like in Paris without caring two hoots about what the rest of the Trade thinks. Even Sir John Higgins might flinch at undertaking such a job in relation to the British Aircraft Trade.

But surely, as neither the S.B.A.C. nor the Air Ministry could do anything about the Paris Show, a syndicate of British Aircraft firms, registered as a Limited Company, could have bought space as an ordinary commercial under-

FOR CANADA.—A D.H.61 (Bristol Jupiter VIII geared engine) seaplane being launched at the Rochester Works of Short Bros. This machine is for use in Canada and is fitted with Short all-metal floats.
(*"Aeroplane" photograph.*)

Proved by Performance!

Napier aero engines have actually given the following service. The cases cited are not isolated but typical examples of what you can obtain with ordinary careful maintenance.

NAPIER engines in the Royal Air Force have often run 400 hours (40,000 miles) without overhaul.

A Napier engine in use by Imperial Airways has just run 440 hours (44,000 miles) since it was last dismantled.

Eighteen Napier engines in use by Imperial Airways have flown an aggregate of over 3,000,000 miles in service. One engine has over 305,000 miles to its credit.

Twice have the Royal Air Force carried out Service flights with four Fairey-Napier aircraft from Cairo to Cape Town and back. A total engine mileage of 100,000 has been covered without any mechanical trouble. The engines were ordinary standard Napiers taken from stores without any special tuning.

The Royal Air Force are now engaged upon the most ambitious flying cruise ever attempted. Four Supermarine-Napier " Southampton " flying boats are flying in formation and have now reached Western Australia from England, a total engine mileage of 112,000 having been covered without mishap. Napier engines were also selected for this flight.

If you place reliability and efficiency above everything you will follow the example of those who know and select the—

NAPIER

The finest aero engine in the World

'Phone
Chiswick
1220

'Grams
Moneyer,
Act, London.

D. NAPIER & SON LTD.
ACTON, LONDON,
W.3

taking and could have shown samples of each firm's machines on a co-operative basis at small expense.

The German Show.

Now the question arises, what are we going to do about the German Show? It is essentially a show of civil aircraft, for Germany is not allowed to have any aircraft of war. Nevertheless practically every European nation is taking a hand in the Show and most of them are doing so with Government support.

France, for example, has applied for 1,600 square metres of space through the *Chambre Syndicale*. A space measuring roughly 40 yards by 40 yards is quite enough to make a very respectable show of commercial aircraft.

Italy, with an official application from the Government and various firms, has applied for 1,400 square metres.

Czechoslovakia, likewise with the support of the Government and the Industrial Association, has also applied for 1,400 square metres.

The Russian Government has applied for 800 square metres.

Sweden and Belgium have each applied for 300 square metres.

Several firms in Spain are combining to make a show.

The Austrian, Hungarian and Danish air traffic companies are also participating.

The United States, through the Aeronautical Chamber of Commerce of America, is taking a hand in the Show, though just what is not quite clear.

Greece, Rumania, Switzerland, Mexico, and the South American countries will be represented, presumably by some kind of advertisement of the possibility of aviation in those countries.

But, so far as one can gather from the organisers of the Show, nothing definite has been fixed by any British firm.

A Great Opportunity.

If ever there was a Show at which we ought to be thoroughly well represented it is that at Berlin. So far as Civil Air Traffic is concerned Berlin is the centre of the World. The German air-lines with their big subsidies, which are possible because Germany has no Air Force to support, maintain what represents a really respectable air fleet of thoroughly modern aircraft.

Undoubtedly we in this country could produce vastly better passenger aeroplanes if it were worth our while. In fact the few commercial aeroplanes which are owned and operated by Imperial Airways Ltd. have proved themselves to be far more efficient than the German air line machines, because we know that the running costs of Imperial Airways are very much lower than those of the German lines.

Unfortunately the few air-liners owned by Imperial Airways are all in regular use on the short lines operated by the firm. Consequently we cannot exhibit at Berlin a De Havilland Hercules or an Armstrong Argosy or even one of the reliable if somewhat aged Handley Pages.

We have as yet nothing in the way of a 200 h.p. or even a 450 h.p. cabin machine to show, unless by chance the promised Avro happens to be finished by then and is available for show purposes, or unless the De Havilland Co. chooses to show one of the new D.H.61s, or the new monoplane, which rumour says is being built by the firm. But we could at any rate make a very good show of Moths and Avians and Widgeons and Bluebirds. And the Imp would cause quite a lot of interest among the intelligent Germans and other visitors from Central and Northern Europe.

Also, perhaps a Fairey III.F or a Sidestrand, or a Wapiti, rigged up with a camera to represent an air survey machine, might pass muster as a civil machine for the purposes of the Show, even though everybody might recognise it as a stripped war machine.

In this way we could at any rate make a British exhibit which would leave the impression that we *can* make aeroplanes, and quite good aeroplanes, in England. It might not be so powerful as the impression which we could make if the whole British Aircraft Industry combined. For then we could put up a show which would absolutely swamp everything else. But we certainly ought to send an exhibit which at any rate will distinctly convey that the British Aircraft Industry is not inferior to that of France and Italy.

If the S.B.A.C. as a whole does not see fit to co-operate in such an exhibit, then certainly if half-a-dozen of the more pushing firms decide to exhibit they can make a much better show by doing it on a co-operative principle and pooling their expenses than if each one tries to do it individually. It will be a thousand pities if British aircraft are not adequately represented at Berlin. And in the end the few thousand pounds which the Trade would spend in putting up an adequate show will be lost many times over through loss of prestige if we are not properly represented.

Side Lines.

Besides actual aircraft exhibits quite large spaces will be devoted to all the different manifestations of aviation. There will be a section devoted to air survey and photography. Here the Aircraft Operating Co. Ltd. and the Air Survey Co. Ltd. could make a very good show. Whether they will consider it worth while is another matter altogether.

Both firms are as busy as ever they can be at present, not only in British Dominions but in foreign countries. Yet even if it costs a good deal to send an exhibit to Berlin it is worth doing, simply for the sake of the prestige which is to be got out of showing to all Continental nations the kind of work which our aerial surveying people can do.

An Air Ministry Opportunity.

Seeing that all foreign Governments are actively supporting their Trade people, this seems to be an occasion on which the Air Ministry ought to do something. Just what the Air Ministry ought to do is a matter for discussion.

Probably the Trade point of view is that the Air Ministry ought to pay for sending a worthy exhibit of British aircraft to Berlin, and that there the Air Ministry's part in the show could end. Personally, one believes that if the Air Ministry were to send to the Berlin Show that extraordinarily fine exhibit of the methods, manners and customs of the Aeronautical Inspection Department which was shown in the gallery at Olympia the last time we had a show in England, nearly as much good would be done to the British Aircraft Industry as by showing our latest and best aircraft.

Nothing impressed the foreign visitors to Olympia quite so much as seeing for themselves how our A.I.D. assured themselves that no British aircraft could get past their inspection unless it was properly airworthy. Ever since Commercial Aviation came into being the A.I.D. Inspection has been the hall-mark of a first-class aeroplane, and it has enabled us to get higher prices for our aircraft from foreign countries than any other nation has been able to get.

Our aircraft are the best in the World. We know it, and we say so to ourselves. But we don't take enough trouble to tell the World about it.

The Aeroplane carries the advertisements of the British Aircraft Industry to everybody who matters in every part of the World. But, with a few successful exceptions, those advertisements do not claim nearly enough for the goods which they advertise. They are posters rather than travelling salesmen, as they should be.

Nevertheless, thanks to The Aeroplane, the names, at any rate, of the firms are known to the World. It is up to the Trade to prove by sample and example that British Aircraf *are* the World's Best.—C. G. G.

BRITISH AIRCRAFT IN CANADA.

Enormous as is the circulation of *The Daily Mail* there are some people in this country who do not read it every day. Therefore some people in the Aircraft Industry mus have missed an article which appeared in that eminent pape on June 6. For the good of the souls of the Aircraft Industry one has been given permission by the Editor of *Th Daily Mail* to reproduce the essential portions of this articl in The Aeroplane.

It was written from Toronto by Mr. W. F. Bullock, *Th Mail's* special correspondent in the United States, who wen specially to Canada to investigate the statements that th Aircraft Industry of the United States is capturing th Canadian aircraft business. This will not be news to reader of The Aeroplane, but it is just as well to have corroborativ evidence from an independent source. Mr. Bullock has n interest in the British Aircraft Industry, as we of The Aeroplane have, and therefore he approaches the whole matte with a perfectly open mind.

After stating that the phenomenal development of commercial flying in Canada together with its profits and oppo tunities are being monopolised by United States enterpris and that there cannot be found in the whole of Canada a English aeroplane of more than 80 h.p., he says:

> The full implications of this situation were brought forcibly hom to me two days ago in New York, where I found the English airma Capt. W. J. McDonough, engaged in the purchase of a high-powere seaplane of United States manufacture. He had been called fro Birmingham three months ago to take charge of a flying servi organised to search for gold, copper, and other minerals in Norther Manitoba and the Hudson Bay territory.

£50,000 Order.

> One of his first duties had been to place orders for aircraft in t U.S. to the extent of more than £50,000.
>
> Why do not Canadians, I asked him, buy English aircraft?
>
> His reply was: "Come with me and find out for yourself."
>
> A few hours later I climbed into his seaplane and soon we we winging our way over the sky-scrapers of New York, up the bro waters of the Hudson River, to Lake George and Lake Champlai and thence across the St. Lawrence River.
>
> Both at Montreal and here I was enabled, in a brief space of tim to submit my question, "Why do you not use English air machines to some of the leading authorities on flying in Canada. The repli I received were couched in terms of sincere friendship, but th were unambiguous, and through them all ran a note of deep regr and disappointment. One of my hosts told me:

FAIREY

AIRCRAFT

"I consider English engines the best in the world and I am willing to buy them even if they cost more than the American product, if you will only find me an English machine adapted to the extreme climatic conditions of Canada."

Too Much Bother.

Another remarked:

"The simple fact of the matter is that English manufacturers who are selling their machines in 13 different countries throughout the world do not care to bother with Canada.

"I have in years gone by urged English manufacturers to realise the almost limitless possibilities of Canada as a field for commercial flying. Their replies show lack of enterprise and of interest in Canada. They say that they consider the Canadian market too small to warrant the expenditure of any considerable amount of capital."

A third voice chimed in:

"My experience bears you out entirely. I offered a certain English company a preliminary order for six airplanes provided they would send out a machine for demonstration purposes. Their answer was that while they appreciated my enthusiasm, such a move would be against their considered policy, and that in any case they did not believe in the permanency of the Canadian demand."

The next to speak was the head of another company owning a large fleet of aircraft. He said:

"I approached a well-known English manufacturing establishment and informed its agent that I was prepared to buy if I could have a metal fuselage. The agent became argumentative. 'Our experience,' he said, 'convinces us that our three-ply wooden fuselages are able to withstand the utmost extremes of weather as well as, if not better than, steel fuselages.' I asked him if he had ever flown north of 49 deg.

"He admitted that he had not. 'Then,' I said, 'you do not know the best, whereas we do from experience.' As he insisted that his three-ply wooden fuselage would serve us admirably I left him and placed my order in the United States."

Another man present interposed:

"The curse of most English manufacturers is their insistence on wood. They are also cursed with the Air Ministry whose real policy is the production of military instead of commercial aircraft."

All were agreed that unless English manufacturers were prepared to lay down spare parts in this country and to give service they could not hope to capture Canadian orders.

Imposing figures were cited to me of the growing dimensions of Canadian expenditure on flying. The National Defence Department is spending £600,000 a year for Government operations in the forestry, fisheries, and surveying services. The Post Office Department is spending £50,000.

East of Manitoba no fewer than 20 different companies are operating with more than 100 machines for commercial work. One of these companies alone has a bigger fleet than Imperial Airways. Another has contracts for more than £60,000 of business yearly, and yet another for £30,000. Except for a few toys—"two-seater short-range stuff," as one of my hosts puts it—none of these many and rapidly-multiplying concerns are using English machines.

My hosts were unanimous in declaring that unless English manufacturers wake up to the magnitude of Canadian operations the great Dominion commercial air fleet of the future is destined to be run entirely on United States equipment, most of it manufactured in Canada.

Though it is very late now for effective action there is still time, they think, for the English by a change of tactics to secure a share of Canadian purchases, though they cannot come in any longer on a basis of sentimental ties. At present it is a manufacturers' market. Before the English can get busy that phase of the industry will have passed, and the English will face a grim competitive situation.

What a pity, as one Canadian observed, that the English, whose engine designs are the best in the world, should be so inferior to United States firms in the science of salesmanship.

He doubted if the Mother-country would ever be able to hold her own in mass production of aircraft for the Canadian market, but he thought it would be wise if a commission of experts were sent to this country to study its very exceptional aircraft requirements.

THE ITALIAN POLAR EXPEDITION.

On June 10 statements were published that the Italian exploration ship *Citta di Milano,* mother-ship to the Italian Polar Expedition, had established wireless communication with the airship *Italia,* which has been missing since May 25. The airship alighted about 25 miles from the north coast of North-East Land and 16 miles from Foyn Island, which is the nearest land, and is totally wrecked.

The control-car was knocked off and two men broke their legs. The ship then rose and the rest of the crew came down from 18 or 20 miles away. Both parties are short of food and fuel but can hold out for some time.

In the meantime there are at least four aeroplane relief parties at or proceeding to Spitzbergen. These are led by Lieut. Lutzow Holm and Capt. Riiser Larsen, both of the Norwegian Navy, Capt. Tornberg, of the Swedish Air Force, and Major Maddelena, of the Italian Air Force.

In addition, dog-sledge parties are being sent from Green Harbour, Spitzbergen, to North-East Land.

Sir Samuel Hoare, Secretary of State for Air, has asked the Air Attaché in Rome to convey the following message to the Italian Government:—

> Air Council are greatly relieved to hear that news has been obtained of airship *Italia* and trust that efforts to relieve General Nobile and crew will meet with early success.

THE FIRST TRANS-PACIFIC FLIGHT.

At 15.10 hrs. on June 10 Capt. Kingsford Smith, Mr. Ulm, Lieut. Lyon and Mr. Warner arrived at Mascot Aerodrome, Sydney, in the Fokker monoplane "Southern Cross," thus completing their Pacific flight as originally planned.

They left Oakland, California, on May 31 and flew to Wheeler Field, Honolulu, where they landed on June 1 after covering the 2,400 miles in 27½ hrs.

From Honolulu they flew to Barking Sands on the island of Kauai, and on June 3 they left for Suva, Fiji, and on the following day they landed in Albert Park, Suva, the only available open ground, after covering the 3,138 miles in 34½ hours. As their landing ground did not provide enough room for taking off with full load they were compelled to proceed to Naselai, a distance of 20 miles from Suva, where the beach provided a runway of 1,500 yards.

On June 8 they left Naselai and flew to Brisbane, covering the 1,795 miles in 19 hrs.

Their arrival at Brisbane on June 9 was the scene of great enthusiasm. Over 10,000 people had waited at the aerodrome since sunrise, and on landing the aviators were carried shoulder-high to a stand where they were welcomed by Lieut.-Gen. Sir John Goodwin (Governor of Queensland), the Premier of Queensland, and the Deputy-Mayor of Brisbane. In the evening they attended a reception at the Town Hall.

On June 10 they flew from Brisbane to Sydney. After flying over Sydney to the accompaniment of the blasts of whistles, factory and ship syrens they proceeded to Mascot Aerodrome, where they were welcomed by the biggest crowd that has ever assembled there.

This remarkable flight, the first across the Pacific, which included the longest flight ever made over water, that from Honolulu to Suva, 3,138 miles, has completely vindicated Messrs. Kingsford Smith and Ulm, who since their departure from Australia last year to prepare for this flight have come to be known in Australia as the "Non-Start" or "Non-Hop" Pacific aviators.

In California they faced many difficulties, the most prominent being that of raising finance. They deserve every congratulation in sticking to their job in face of the very worst kind of discouragement, that of being ridiculed by their own people. Had they failed all the critics would have been satisfied, but now that the flight is an accomplished fact it is gratifying to see that the Australian Press has accorded them the praise that is due to them.

There is difficulty in justifying certain long-distance flights over wide stretches of ocean on land-planes, but one must recognise that such flights will always be attempted so long as financial encouragement is forthcoming. That the Pacific Ocean would be flown some day was certain, and that it should have been done in such a brilliant manner for the first time at the first attempt is cause for satisfaction.

One's only fear is that now the flight has been done numbers of other people will attempt to do it again, with less successful results, and thereby more than undo what little good has been done by the "Southern Cross."

Once again the Fokker monoplane and the Wright Whirlwind engine have proved their excellence. But the most outstanding feature of the flight has been the success of the wireless equipment.

Throughout the flight the "Southern Cross" was in constant wireless communication with land, and, if nothing else, this flight has proved the remarkable progress made in developing equipment of light weight that can be expected to give reliable service. After getting off from Honolulu with sufficient fuel for a 3,400-mile flight, *and* wireless equipment, there can now be no excuse for those who in the past have been apt to regard wireless as useless dead weight.

On June 9 the Attorney-General, in the House of Representatives, Canberra, announced that the Australian Government had decided to make a grant of £5,000 to Capt. Kingsford Smith and his associates in recognition of their achievement. He commented on their resolution and determination in the face of financial difficulties, and remarked that the flight was outstanding not only because of the long distances covered, but also because the machine was in wireless communication with the world throughout.

Mr. Coates, the Prime Minister of New Zealand, sent a congratulatory telegram to Capt Kingsford Smith, and also telegraphed to Mr. Bruce, the Prime Minister of Australia, expressing New Zealand's pride that this wonderful feat should have been achieved under two Australians.

Sir Samuel Hoare, Secretary of State for Air, has telegraphed to Mr. Bruce:—

> Air Council tender hearty congratulations on the successful completion of magnificent Pacific flight by Capt. Kingsford-Smith and Mr. Charles Ulm.

The Secretary of State for Air also telegraphed to the Air Attaché at the British Embassy in Washington:—

> Please convey the following message from Sir Samuel Hoare to U.S. Government:—"Air Council tender hearty congratulations on Lieut. Lyon's participation in Pacific flight successfully accomplished.

With its record of successes everywhere and its three years of world-wide service, the Moth has been universally chosen by Governments, Flying Clubs, Aerial Transport Bodies and Private Owners. Full particulars are obtainable from The de Havilland Aircraft Co. Ltd.

the mile-eater

the machine that makes light of a long distance flight

THE MOTH has not built up its reputation merely by one or two spectacular professional flights, but by its three years of yeoman service covering two and three quarter million flying miles. Hereunder is a fraction of the ever-growing list of Moth long distance flights.

First light aeroplane to make London-Cape-Town-London flight. Lieut. R. R. Bentley, A.F.C., S.A.A.F. made this journey with his Moth on which he has covered 25,000 trouble-free miles.

London to Delhi, 5,541 miles. Capt. J. N. Stack, A.F.C. flying a Moth.

London to Calcutta, 6,800 miles. Mr. D. Rooke flying a Moth.

Tour of Central Europe, 4,000 miles. Mr. D. Kittel flying a Moth.

London — Constantinople and back, 4,000 miles. Mr. I. McClure flying a Moth.

Tour of South of France and Italy, 3,500 miles. Her Grace the Duchess of Bedford flying a Moth.

First England-South Africa flight by a lady owner pilot. The Hon. Lady Mary Bailey in her Moth achieved this by her flight from London to Cape-Town, 8,000 miles.

Lisbon to Cairo, 3,000 miles. Senhor Carlos Bleck flying a Moth.

London to Delhi, 5,541 miles. Capt. B. S. Leete, A.F.C. flying a Moth.

London to Tripoli, 1,860 miles. Commander H. McDonald flying a Moth.

Tour of Eastern States of Australia, 4,000 miles. Major de Havilland flying a Moth.

Tour of South of Europe and North Africa, 4,500 miles. Her Grace the Duchess of Bedford flying a Moth.

DH
MOTH

THE MOTH

reets

HE DE HAVILLAND AIRCRAFT CO. LTD., STAG LANE AERODROME, EDGWARE, MIDDX

SIR ALAN COBHAM'S BRITISH TOUR AND HOME-COMING.

On June 5 Sir Alan Cobham, accompanied by Lady Cobham, Brig.-Gen. P. R. C. Groves, the Secretary-General of the Air League, and Mrs. Groves, left Rochester in the Short Singapore (two 650 h.p. Rolls-Royce Condor engines) on a propaganda tour round Great Britain.

They reached Hull at 17.00 hrs. Thousands of people lined the river front and after completing a circuit of the city the Singapore alighted on the Humber. The Lord Mayor and Lady Mayoress and other members of a civic party received the visitors and afterwards Sir Alan and Lady Cobham were entertained at dinner at the Guildhall.

On June 6 the party flew to Tynemouth where the arrival was greeted by thousands of spectators assembled on both sides of the river. Sir Alan and Lady Cobham were received on the Tyne Commissioner's yacht by the Lord Mayor of Newcastle and other civic authorities and were taken up the river to Newcastle where they were entertained at lunch by the Newcastle City Council.

After lunch they resumed their flight to Leith where they arrived at 17.00 hrs. The visitors were received at the docks by the senior magistrate of Edinburgh and were later entertained at dinner.

On June 7 the party flew from Leith to Gourock and spent the day in Glasgow.

On June 8 they reached Belfast. They were accorded a civic welcome by the Deputy Lord Mayor and were later entertained at lunch at the City Hall.

On June 9 they arrived at Cardiff from Belfast.

On June 10 they flew to Southampton, where they were received on the Supermarine slipway by the Mayor. The Singapore was met by the Supermarine motor-boat which towed it in. It remained on the mooring buoy for the night where it was looked after by the Supermarine launching crew.

General Groves, on behalf of the Air League, made a speech eulogising the feat accomplished by Sir Alan and mentioned the good spirit existing in the British Aircraft Industry inso-much-as a rival firm had been pleased to turn out on a Sunday and arrange for the safe landing of the Singapore and he thought such action was worthy of the highest ideals of co-operation in the British Aircraft Industry, and wished to thank the Supermarine Works for the arrangements which had been made for Sir Alan Cobham's reception at Southampton

The Singapore's Home-Coming.

On Monday the Singapore flew north from Southampton to Reading, and then followed the river Thames to Rochester, passing through London at about 13.45 hrs and reaching the Medway in the midst of a sharp hail and thunderstorm a little after 14.00 hours.

Capt. Worrall, who is suffering from malaria, had been left at Cardiff, and Lord Thomson and Sir Vyell Vyvyan replaced Brig.-Gen. and Mrs. Groves as passengers on the trip from Southampton.

After landing, Sir Alan Cobham walked from Short Brothers' works to the Rochester Guildhall amid the cheers of a large number of the inhabitants who had gathered to do him honour.

At the Guildhall Sir Alan and Lady Cobham, Mr. F. Green and Mr. Conway of Rolls-Royce Ltd., who had acted as mechanics, and Mr. C. R. Bonnett, the cinematograph operator, were received by the Mayor and Corporation of Rochester, supported by the Mayor of Gillingham and representatives of the neighbouring towns, in the presence of a considerable company composed in part of distinguished local residents and in part of representatives of the Air Ministry, and of bodies representing aeronautical interests.

The Mayor of Rochester (Mr. F. C. A. Matthews) said that the City of Rochester was proud of its historic association with naval enterprises, and now had reason for equal pride in its association with the pioneer work which had led to Sir Alan Cobham's great achievement. The Singapore flying-boat used on this great flight was a Rochester product, and only one of a long line of successful aircraft made by Short Brothers. The flight had started from Rochester and had now ended triumphantly at the same place.

He had to express the deepest regret that Lady Cobham had caught so severe a chill on returning to England, and the greatest admiration for her pluck in continuing the journey to Rochester and attending the reception when she was obviously far from well.

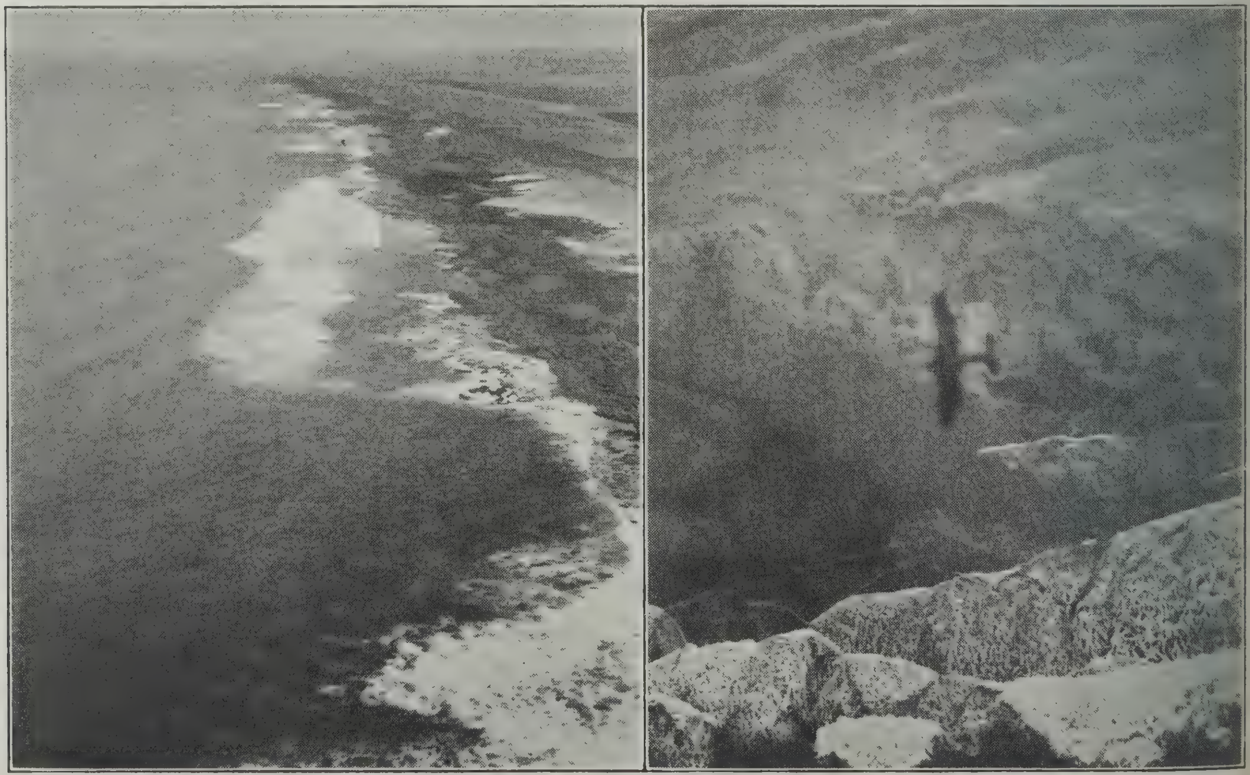
He also regretted greatly that Capt. Worrall, who was suffering from a sharp attack of malaria, was unable to be present.

The Mayor then presented, on behalf of the City of Rochester, a chiming clock to Sir Alan, and a set of teaspoons bearing the arms of Rochester in enamel to Lady Cobham. On behalf of Short Bros. Ltd. and Rolls Royce Ltd. conjointly, he presented to Sir Alan and to Lady Cobham two silver rose bowls, and on behalf of the same two firms, a silver model of the Singapore to each member of the crew.

Mr. Oswald Short, of Short Bros. Ltd., said that the story of this flight round Africa would, he was sure, serve as a stimulus to the youth of this country to carry on development of aerial enterprise throughout the Empire. He was proud both for his firm and for the city of Rochester that the Singapore had been chosen for the flight, and he had to express his appreciation of the way in which Rochester men had put their backs into the original production of that machine, and into the extra work that became necessary when there had been trouble at Malta.

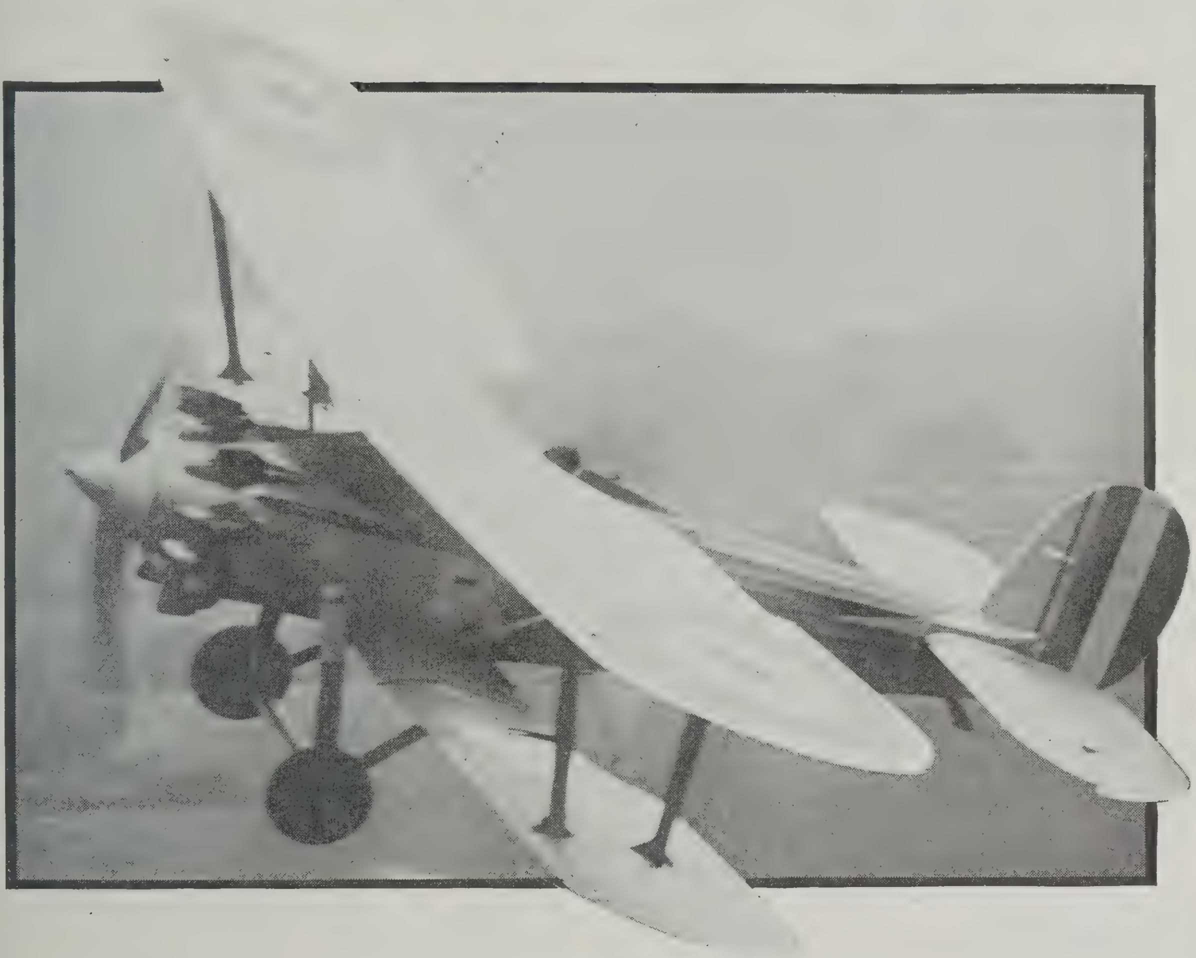
The flight had only been made possible by the willingness of the Air Ministry to lend them the machine for the purpose, and he wished to express his thanks to that Department.

Mr. Basil Johnson, Managing Director of Rolls-Royce Ltd., said that Rolls-Royce Ltd. were proud that their engines had been chosen for this flight, and that they had proved worthy of the trust reposed in them. He was particularly interested in this flight, because he had spent some years in Africa, and he had vivid recollections of journeys of 300 miles or so made with the aid of a train of sixteen mules



THE WEST AFRICAN COAST.—Photographs of the famous South Atlantic surf on the West Coast, taken from Sir Alan Cobham's Short Singapore,—whose shadow is seen in the right-hand picture.

"Bristol"



A Single-Seater Fighter embodying the latest "Bristol" practise in steel construction will be exhibited on the "Bristol" Stand at the Paris Aero Exhibition, June 29th to July 15th, 1928.

THE BRISTOL AEROPLANE CO., LTD.,
FILTON ——— BRISTOL.

Telegrams:—
"Aviation, Bristol."

Telephone:—
3906 Bristol.

which took over a week to accomplish. To Sir Alan such a journey was a mere morning jaunt, from which it was possible to assess the value to our Colonies of aerial transport.

Sir Alan Cobham in reply paid tribute to the help he had received from his crew. Firstly he would mention his wife who had charge of the commissariat and had acted as his secretary in the drawing up of reports. She had also given him much valuable advice as to the woman-passenger point of view in regard to air travelling.

Capt. Worrall, his assistant pilot, had been of the greatest value, throughout the trip, and his long experience of flying-boats had been most valuable. It was most unfortunate that a chill contracted on reaching this country should have brought on an attack of malaria and so kept him from being present.

Mr. Green and Mr. Conway, who had been lent by Rolls-Royce Ltd., to look after the engines, had both worked cheerfully and well throughout the trip, and to their efforts and their knowledge must be attributed much of the success of their flight.

Mr. Bonnett, their cinematographer, was one of the finest of the world's press photographers, and always knew the right occasion for securing a telling photograph. In addition he had proved himself to be both Jack and master of all trades, and had turned his hand on the journey to any and every job that the occasion might require with the greatest cheerfulness and good effect.

The flight was made possible as a result of private enterprise. Sir Charles Wakefield had as usual played a prominent part. Short Bros. Ltd., and Rolls-Royce Ltd., had produced the machine and engines, aided by the many sub-contractors who had produced essential materials and components, among whom he must mention James Booth and Co., who made the duralumin from which the Singapore was built, the British Thomson-Houston Co., whose magnetos had never given them a moment's trouble throughout the trip, Cellon Ltd. who had supplied the dope, and Rylands Ltd., whose paints and varnishes they had used in large quantities. To all these and to many others who had contributed to the success of the flight he had to express his thanks.

After the proceedings at the Guildhall one was given an opportunity of a short look round the Singapore which by then was in Short Bros.' shed. Apart from a few dents in the hull-bottom—souvenirs of the mishap at Malta, and some signs of exposure on paint work and fabric, the machine is in first-class condition throughout. Above the water-line where the hull is covered with a transparent varnish, it can be seen that the duralumin plating is entirely free from corrosion. Below the water-line such portions of the skin as have lost their coating of paint are in equally good condition.

It is reported that a few rivets in secondary parts of the machine have shown signs of corrosion, but that the essential structure of the machine is as sound as when it left Rochester seven months ago. This seems to settle fairly completely any question as to the reliability of duralumin as a material for seaplane construction.

FAIREY AIRCRAFT FOR THE ARGENTINE.

In the face of international competition the Fairey Aviation Co. Ltd., of Hayes, Middlesex, have succeeded in obtaining an order for a number of Fairey III.F general-purposes aircraft from the Argentine Navy.

This order, following so closely on that for the same type from the Chilean Government, obtained some months ago, is eloquent testimony to the quality of British aircraft and reflects great credit on all those who have been concerned in obtaining the order.

The Fairey III.F which is standard equipment for Bombing and Fleet-Spotter-Reconnaissance work in the R.A.F. is highly versatile. It is being supplied to the Argentine Navy as a general-purposes convertible landplane or seaplane. It can be used as a long- or short-range bomber, a reconnaissance, fighting or photographic machine, as a commercial three- or four-seater, can be fitted with any type of engine, air or water-cooled, and in these capacities it can be rigged as either a landplane, seaplane or amphibian.

It can be built of wood or metal, and such is the interchangeability of parts in the machine that apart from being supplied with either metal wings and fuselage or wooden fuselage and wings, any of these components can be substituted by others of different material without any change. In emergency the machine can even be fitted with one metal and one wooden wing, metal wings and wooden ailerons, or *vice versa*, metal tail and wooden elevators, and so on, without any deterrent effect on the performance or balance of the machine.

This interchangeability coupled with the variety of service and the high all-round performance of the III.F make it a machine of particular value to foreign air forces. The fact that so early in its life it has been purchased by Chile, the Irish Free State and the Argentine shows that its qualities are already recognised abroad. When it is realised that in obtaining these orders the III.F was in competition with many other well-tried Continental types of much lower capital cost, the success of the Fairey Company is all the more meritorious.

In all this the III.F is following closely on the success of the III.D. For something like five years the III.D has been the standard Fleet Reconnaissance float seaplane of the R.A.F. and it is still in use in large numbers. As someone remarked, "the Fleet Air Arm spends its time making various machines fly, and the III.D does the work for the Fleet."

It has also been supplied to the Australian Government, the Portuguese Navy and the Dutch Navy for use in the East Indies. One of those supplied to the Portuguese Navy in 1922 is shown below. This machine is still in active use in Portuguese China.

THE FLIGHT TO INDIA.

At dawn on June 10 the Fokker F.VII (Bristol Jupiter engine) piloted by Mr. C. D. Barnard and Mr. E. H. Alliott with Her Grace the Duchess of Bedford as passenger left Lympne in an attempt to fly to India in four stages. In taking off in a south-westerly direction the machine struck the telegraph wires on the edge of the cliff above Romney Marsh, breaking four of them.

The first stage to Sofia (1,260 miles) was completed in a non-stop flight in 14 hours.

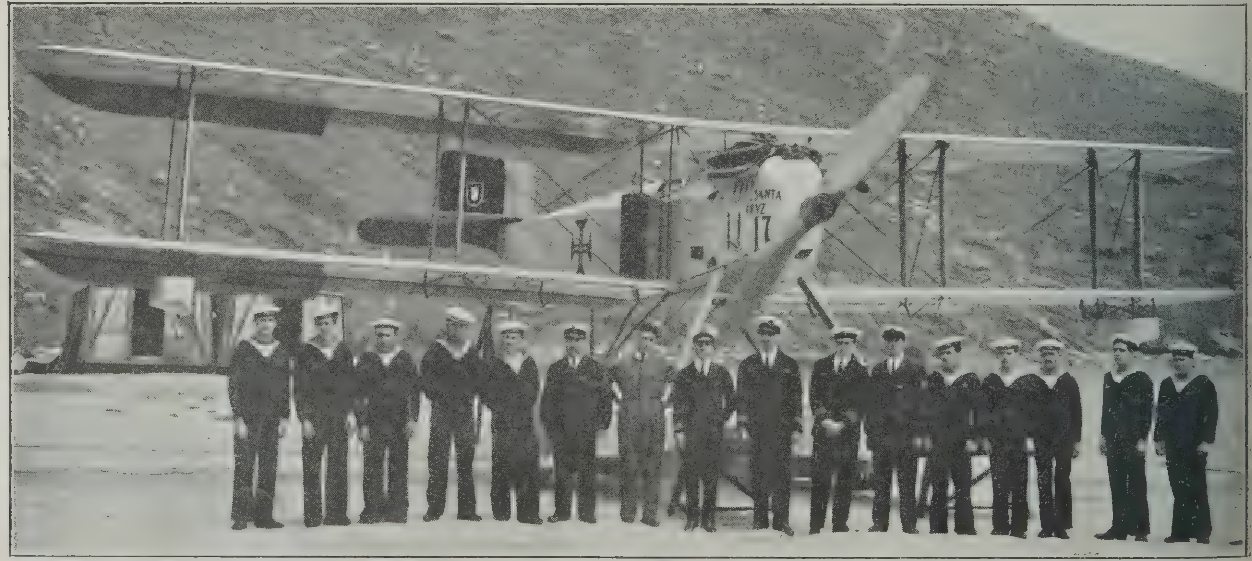
On June 11 they left Sofia at 05.00 hrs. for Aleppo.

THE KING'S CUP RACE.

The committee of the Royal Aero Club has decided that the King's Cup Race, which begins on July 20, shall finish at Brooklands Aerodrome on July 21, instead of at Hendon Aerodrome as previously announced.

Intending competitors are reminded that entries close 17.00 hrs. on Friday, June 29.

The Siddeley Trophy Tour, the handicap race for light aeroplanes, will be flown simultaneously. Entries for this also close at 17.00 hrs. on Friday, June 29.



PORTUGUESE COLONIAL AVIATION.—A Fairey III.D (Rolls-Royce Eagle engine) at the Macau Air Station, on the island of Taipa, opposite Hong Kong, South China. This machine is the actual one on which the late Capt. Saccadura Cabral and Rear-Admiral Gago Coutinho crossed the South Atlantic in 1922. The Macau Air Station is commanded by Lieut. José Cabral, who is seen in the middle of the group.

Blackburn
- IRIS -

"THE THREE-ENGINED BLACKBURN 'IRIS' with metal hull is one of the recent successful types of flying boat. A small production order has been placed for this type and it is believed that one of the new flying-boat flights referred to by Sir Samuel Hoare will be equipped with 'Iris' flying boats."

"THE NAVY," APRIL, 1928.

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"HONOUR IS THE SUBJECT."

Over four hundred people foregathered at the Savoy on June 8 to attend the Banquet given by the Royal Aeronautical Society, the Royal Aero Club, the Society of British Aircraft Constructors, and the Air League of the British Empire in honour of Mr. A. V. Roe, O.B.E., F.R.Ae.S., M.I.Ae.E., and in recognition of his pioneer work for British Aviation twenty years ago. Sir Charles Cheers Wakefield, Bt., C.B.E., D.L., J.P., hon. F.R.Ae.S., was in the Chair.

H.R.H. the Duke of York was present at the dance which followed the dinner.

After the Royal Toasts had been honoured, Sir Charles Wakefield proposed the health of Mr. A. V. Roe. Sir Charles said that as presumably great men had the same feelings as ordinary men, he thought that Mr. Roe must be very gratified at the wonderful audience assembled. He then read telegrams of congratulation to Mr. Roe, from Mr. Guggenheim, The French Aeronautical Society, the Director of Aviation of the French Government, the Naval Attaché at the French Embassy in London, Capt. Geoffrey de Havilland, Sir William Letts and Sir Sefton Brancker, and others.

Sir Charles went on to say that he himself had spoken at a City Meeting on March 2, 1910, on behalf of the Aerial League of Great Britain, but his remarks had fallen on dry ground. When he was Lord Mayor in 1915 and 1916 he had seen from the roof of the Mansion House the first Zeppelin brought down. This dinner was a great event in the history of aviation and he would try to express on behalf of all present their feelings about Mr. A. V. Roe.

They were assembled to pay long overdue honour to a man who had left his mark on World Aviation. Mr. Roe had become famous in spite of having that handicap of true genius, modesty. He had been content for long years to let his actions speak for him and they had spread far and wide. Mr. Roe was going to be asked to do violence to his modesty to-night and tell of his hopes and aims.

He had turned his thoughts to aeronautics as far back as 1902 and his brother, Mr. H. V. Roe, had shared his faith. Mr. A. V. Roe had produced the first totally-enclosed aeroplane and in 1914 came the world-famous 504 Avro which had played a wonderful part in the War.

In a complete summary of Mr. Roe's achievements mention must be made of the able assistance of Mr. John Lord, Mr. Parrott and Mr. Chadwick. The British Race was not yet devoid of original genius and this evening they were doing honour to a man of their own kith and kin, who, gifted with exceptional genius, courage and determination, had won immortal fame by his creative work in a new field of endeavour.

Mr. A. V. Roe, replying, said that he had expected a pleasant little party of about half-a-dozen but he was not grumbling and it was very nice of everybody to turn up. He thought it was rather rough luck that he had to stand there just because he happened to be one of the early birds. He had evidently been destined to spend an aviatic life. He flew—into a rage—at three weeks old. His next flight was down the stairs at two years old and then over the handle-bars of his bicycle at six. Mr. Roe went on to describe his early experiments from the time when at sea as a marine-engineer he watched an albatross and thought how easy it would be to construct an aeroplane.

He described how he won *The Daily Mail* prize in 1906 for a power-driven model aeroplane and how later, he made a full-sized machine and took it to Brooklands.

Mr. Roe's cheerful acceptance of the trials and disappointments of those years was reflected in his speech which kept the audience in roars of laughter. He made light of his own endeavours and stressed the work of his contemporaries in the same field. He ended by paying a tribute to those who had loyally helped to make the firm of A. V. Roe and Co.

Sir Samuel Hoare, proposing the Chairman, said that he was delighted as a member of the Government to have the opportunity of paying tribute to so great a pioneer.

Those in places of honour at the Chairman's Table were :—Col. The Master of Sempill, A.F.C., A.F.R.Ae.S., President R.Ae.S., Sir Oliver Swann, K.C.B., C.B.E., and Lady Swann, Mr. F. R. Simms, M.I.Mech.E., M.I.A.E., M.I.Ae.E., Sir Francis K. McClean, A.F.C., A.F.R.Ae.S., and Lady McClean, Mr. Philip Foster (Air League), Sir George Higgins, C.B.E., and Lady Higgins, Captain W. Brass, M.P., Sir Edward Crowe, C.M.G., and Lady Crowe, Lieut.-Colonel M. O'Gorman, C.B., D.Sc., F.R.Ae.S., Mr. A. V. Roe, O.B.E., F.R.Ae.S., M.I.A.E., and Mrs. Roe, Sir Charles C. Wakefield, Bart., C.B.E., D.L., J.P., Hon. F.R.Ae.S., and Lady Wakefield, The Rt. Hon. Sir Samuel Hoare, Bt., C.B.E., C.M.G., M.P., Capt. The Rt. Hon. F. E. Guest, C.B.E., D.S.O., M.P., Mr. H. V. Roe and Dr. Marie C. Stopes, D.Sc., Ph.D., F.L.S., F.R.S.L., Air Vice-Marshal Sir John Higgins, K.B.E., K.C.B., D.S.O., A.F.C., and Lady Higgins, Major E. G. E. Beaumont, O.B.E., and Mrs. Beaumont, Admiral Sir Richard Webb, K.C.M.G., C. B., and Lady Webb, Capt. P. D. Acland and Mrs. Acland, Mr. G. Holt-Thomas, Lieut.-Commander J. M. Kenworthy, R.N., M.P.

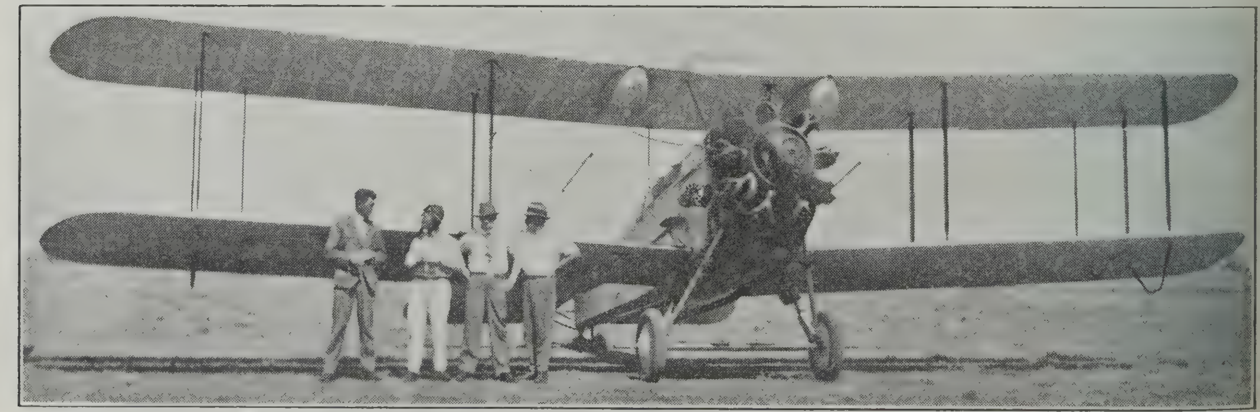
Most of the Aircraft Industry and many pioneers of Aviation were among those present.

RUSSIAN FIREWORKS.

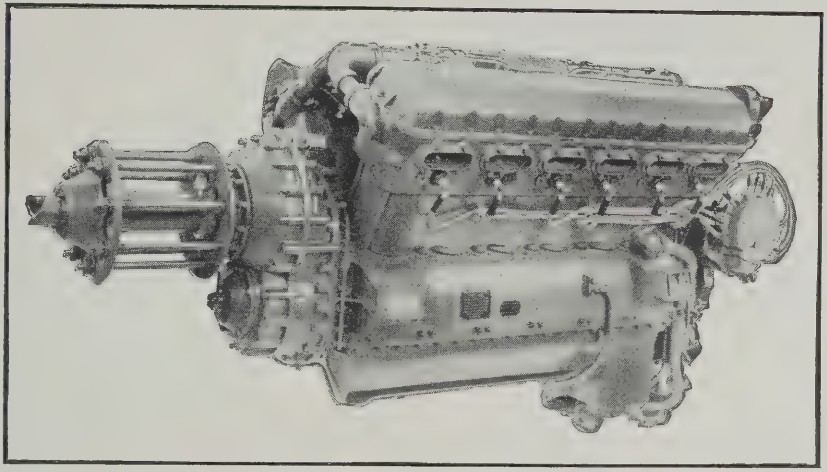
According to *The Times* correspondent in Riga the Soviet authorities have published the results of a " great air attack on Leningrad," which, after many weeks of preparation, was carried out last week to synchronise with the Russian Whitsuntide. Gas masks were widely distributed among members of the public, who were informed that an " interventionist " was about to attack the city, and were instructed how to act. They were notified that as soon as the enemy was sighted ship sirens, locomotive whistles, factory buzzers, and church bells would give the alarm, and everybody must rush to the nearest house where a gas refuge had been arranged in the cellars. The public was further informed that the enemy would drop bombs containing a harmless gas, with, however, a smell to create an atmosphere of reality. The police, Red Cross, fire brigades, and other street officials would wear gas-masks, and the Komsomoltsi [Young Communists] would be mobilised and stationed at various points to serve, when commanded, as killed, gassed, or wounded, whom the Red Cross would take away on stretchers.

Just before 5 p.m. on June 2 the alarm was sounded and the show began. Red aeroplanes flew up to meet the attacking Blues. An air fight took place outside Leningrad, but the enemy appeared over the city and bombed, more or less successfully, the Putiloff Works and the Treugolnik rubber factory, caused fires elsewhere, and gassed a large part of the city. An air fight took place over the centre of Leningrad, and the Blues retired amid the din of anti-aircraft guns.

The Soviet accounts were more enthusiastic before than after the " manœuvres," which, apparently, were not so good as they were advertised to be. The test was not nearly on the grand scale announced, and the official report says that only 30 aeroplanes altogether took part. The Soviet Press says that the public proved disappointing. Although the people received adequate instruction, *Izvestia* writes, they persisted in regarding the affair as " an ordinary street sight rather than as a serious manœuvre." The Commander of the Leningrad District and his Chief of Staff state that it was " quite satisfactory, and demonstrated a great improvement in the efficiency of the Soviet air forces."



THE HIGHEST-POWERED AUSTRALIAN CIVIL AIRCRAFT.—A D.H.50, with 450 h.p. Bristol Jupiter engine, built by the Quantas Company. From left to right are Mr. Hudson Fysh (the Managing Director), Mr. E. J. Stephens (test pilot), Mr. E. W. Densham (of the Bristol Co.), and Mr. W. A. Baird (Manager of the Quantas Works at Longreach).



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The new Rolls-Royce 'F' aero engine, designed by Mr F. Henry Royce, has successfully passed the British Air Ministry's 100-hour test at the first attempt. This noteworthy achievement is a further tribute to the reliability of Rolls-Royce aero engines for which, since their inception, they have always been renowned.
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THE ROYAL AIR FORCE.

The London Gazette.

June 5.

General Duties Branch.—Plt. Off. R. F. Part is promoted to the rank of Flg. Off. (Jan. 30); Flt. Lt. A. P. Davidson is restored to full pay from half-pay (May 21); Flg. Off. T. Sullivan is placed on the retired list on account of ill-health (June 6). The following officers resign their S.S. comns.:—Flg. Off. L. H. Weedon (May 18); Plt. Off. E. F. Shine (May 23).

Medical Branch.—Flt. Lt. H. B. Troup is promoted to the rank of Sq. Ldr. (June 6); Flg. Off. F. F. Anslow is promoted to the rank of Flt. Lt. (Dental) on promotion to the rank of Capt. in the Army Dental Corps with effect from Mar. 26 and with seniority of Oct. 1, 1927; Flt. Lt. (Hon. Sq. Ldr.) H. C. Perkins relinquishes his temp. comn. on completion of service and is permitted to retain the honorary rank of Sq. Ldr. (June 6). The following Flt. Lts. (Capts., Army Dental Corps) relinquish their temp. comns on return to Army duty (June 1):—F. S. S. Whiter, F. F. Anslow.

Reserve of Air Force Officers.—General Duties Branch.—F. A. Wardell is granted a comn. in the Special Reserve as Plt. Off. on probation (June 1); Plt. Off. on probation H. Buckingham is confirmed in rank (May 23).

Appointments.

Week ending June 11.

General Duties Branch.—Wing Commander J. V. Steel, O.B.E., to R.A.F. Depot, Uxbridge, 1/5.

Squadron Leader D. E. Stodart, D.S.O., D.F.C., to R.A.F. Depot, Uxbridge, 4/6.

Flight Lieutenants H. R. B. Howell, to R.A.F. Depot, Uxbridge, 28/4. V. M. Kenny-Leveck, to R.A.F. Depot, Uxbridge, 4/5. R. St. H. Clarke, A.F.C., to A.A.E.E., Martlesham Heath, 29/5. J. W. Baker, M.C., D.F.C., to R.A.F. Depot, Uxbridge, 5/4. A. J. E. Broomfield, D.F.C., to R.A.F. Station, Hornchurch, 1/4.

Flying Officers J. H. McN. Campbell, to R.A.F. Depot, Uxbridge, 23/5. J. A. E. Inkster, to No. 504 Sqdn., Hucknall, 27/5. B. F. O. Smith, to No. 3 F.T.S., Grantham, 31/5. A. A. Jones, to R.A.F. Depot, Uxbridge, 20/4. F. E. North, to School of Army Co-operation, Old Sarum, 21/5.

Medical Branch.—Wing Commanders F. N. B. Smartt, M.B., B.A., to No. 1 Air Defence Group H.Q., 15/6. W. A. S. Duck, O.B.E., to Wessex Bombing Area H.Q., Andover, 4/6.

Flight Lieutenants J. K. R. Landells, M.B., to R.A.F. Depot, Uxbridge, 17/5. G. E. Church, M.B., to R.A.F. General Hospital, 'Iraq, 13/5. Flight Lieutenant (Dental) A. H. Mills, to H.Q., Cranwell, on appointment to a Temp. Comn., 1/6.

Flying Officers J. Hill, M.B., to R.A.F. Combined Hospital, 'Iraq, 9/5. L. Freeman, to Station H.Q., Hinaidi, 10/5. Flying Officers (Dental) A. P. McClare, to R.A.F. Station, North Weald, 11/6. H. D. Humphreys, to R.A.F. Depot, Uxbridge, on appointment to a Temp. Comn., 1/6

Fatal Accidents.

The Air Ministry regrets to announce that as the result of a collision in the air at Upavon between two Woodcock machines of No. 3 (Fighter) Squadron, Upavon, on June 5, Flg. Off. Douglas James Frederick McMillan and Flg. Off. Philip Cranswick, M.C., the pilots and sole occupants of their respective aircraft, were killed.

At the inquest on June 5 Wing Cdr. W. R. Read stated that he had ordered up certain machines for practising formation attack. In the third phase of the operation, in which four Woodcocks were matched, the Woodcocks carried out a dive in pairs, and the wing-tips of the pair piloted by Flg. Offs. Cranswick and McMillan came into contact about 1,500 ft. up. Both machines immediately collapsed.

The pilots were equipped with regulation parachutes, and McMillan jumped out of his machine when about 500 ft. from the ground. This did not give the parachute time to open, and it had just started to open as he touched the ground. The machines fell about 300 yards apart. McMillan fell near his machine, but apparently Cranswick was unable to get clear, and fell with his machine. The Coroner recorded a verdict of "Accidental Death."

The Air Ministry regrets to announce that as the result of an accident near Mosul to a Bristol Fighter machine of No. 6 (Army Co-operation) Squadron, Mosul, on June 8, 335654 Sjt. Alfred Joseph Garner, the pilot of the aircraft, and 158714, Sjt. William Frank Futcher, were killed.

The Aden Garrison.

Mr. Penny (Lord of the Treasury), replying to Mr. Thurtle in the House of Commons on June 5, said that the present strength of the Aden garrison was one British battalion; two batteries, Royal Artillery; one Fortress Company, Royal Engineers; one squadron, Royal Air Force; one armoured car section and ancillary services. The present strength represented a decrease in numbers as compared with two years ago, the withdrawal of an Indian infantry battalion and a reduction in ancillary services having more than counterbalanced an increase in the Air Force strength from a flight to a squadron.

The Italian Visit.

The squadron of aeroplanes of the Royal Italian Air Force, under the command of General Balbo, which is to visit this country in the course of the next few weeks will not take any part in the R.A.F. Display. The personnel of the squadron will visit the Display as the guests of the Royal Air Force.

The Royal Tournament.

The semi-final and final results of the Tug-of-War Championships were decided at Olympia during the last week of the Royal Tournament. The results were as follows:—

R.A.F. Championships.—(110 stone) *semi-final*: R.A.F., Uxbridge, beat R.A.F., Gosport, by two pulls to nil. *Final*: R.A.F., Uxbridge, beat R.A.F., Andover, by two pulls to nil. (130 stone) *final*: Home Aircraft Depot, Henlow, beat R.A.F., Andover, by two pulls to nil.

Inter-Services Championship.—(130 stone) *semi-final*: Royal Marines, Portsmouth, beat the Home Aircraft Depot, Henlow, by two pulls to nil. *Final*: Royal Marines, Portsmouth, beat the 2nd Batt. Cameron Highlanders by two pulls to nil.

The R.A.F. Rifle Association.

The eighth annual meeting of the R.A.F. Rifle Association was held at Bisley on June 4, 5, 6 and 7.

The results in the various competitions were as follows:—

Duke of Sutherland's Challenge Cup (Individual Rifle Championship).—Flg. Off. G. H. Stainforth (Wittering), the cup, R.A.F.R.R. silver medal, and N.R.A. silver medal, 329; 2, F-S. F. King (Halton), R.A.F.R.A. bronze medal, 316; 3, Flg. Off. S. Wallingford (Calshot) (holder), 311; 4, Cpl. A. W. Hulse (Cranwell), 304; 5, Sjt. F. P. Gee (Uxbridge), 304; 6, Sjt. A. Worden (Eastchurch), 304; 7, Cpl. A. J. Whiting (Eastchurch), 304; 8, Flt. Lt. W. J. G. Walker (Eastchurch), 304.

Chief of the Air Staff's Cup (Station Rifle Team Championship).—1, Eastchurch, 1,126; 2, Felixstowe, 1,090; 3, Sealand, 1,070; 4, Halton, 1,066; 5, Wittering, 1,056; 6, Cranwell, 1,048.

Brooke-Popham-Steel Cup (Squadron rifle teams).—1, No. 502 (Ulster) (Bombing) Squadron (Aldergrove), 495; 2, No. 4 (A.C.) Squadron (Farnborough), 485; 3, No. 99 (Bombing) Squadron (Upper Heyford), 471; 4, No. 9 (Bombing) Squadron (Manston), 451; 5, No. 12 (Bombing) Squadron (Andover), 445; 6, No. 41 (Fighter) Squadron (Northolt), 413.

Barton Challenge Cup (Individual Revolver Championship).—1, Flt. Lt. C. W. Hill (Henlow), 175; 2, Wing Cdr. S. Grant-Dalton (Eastchurch), 161; 3, Flg. Off. S. Wallingford (Calshot), 156; 4, Flt. Lt. H. C. Calvey (Kenley), 150; 5, Flt. Lt. A. E. Dark (Eastchurch), 147; 6, Air Commodore F. C. Halahan (Cranwell), 146.

Halahan Cup (Individual Pistol Championship).—1, Flt. Lt. J. L. K.

FLYING KIT.—The pilots and observers of No. 39 (Bombing) Squadron, R.A.F., in full flying kit. Pilots wear the seat type Irving parachute and gun-observers wear the lap type. No. 39 (Bombing) Squadron, which is under orders for India, is stationed at Bircham Newton, Norfolk, and is equipped, until it moves to India, with D.H.9as. The Squadron is commanded by Sq. Ldr. H. V. Champion de Crespigny, M.C., D.F.C.

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Pearce (Cranwell), 65; 2, Air Commodore F. C. Halahan (Cranwell), 62; 3, Wing Cdr. S. Grant-Dalton (Eastchurch), 59; 4, Flg. Off. G. H. Stainforth (Wittering), 59; 5, Flt. Lt. C. E. Hill (Henlow), 54; 6, Flg. Off. S. Wallingford (Calshot), 53.

SALMOND CUP (Team Pistol Match).—1, R.A.F. College, Cranwell, 216; 2, Eastchurch, 194; 3, Gosport, 170; 4, Flowerdown, 164; 5, Wittering, 146; 6, Halton, 137.

WHITELOCK CHALLENGE CUP (Young Airmen's Championship).—Queen Mary conditions; h.p.s., 200 points—1, L-AC. Boucher (Eastchurch), 158; 2, Flg. Off. H. R. D. Waghorn (Wittering), 148; 3, AC.2. Hall (Manston), 148; 4, L-AC. C. H. McNair (Henlow), 146; 5, Cpl. Clayton (Andover), 145; 6, AC.1. Penfound (Gosport), 142; 7, Cpl. Lydall (Calshot), 139; 8, L-AC. Wills (Henlow), 139; 9, AC.2 Prince-Cox (Gosport), 137; 10, Flg. Off. T. H. Carr (Martlesham).

R.A.F. SPORTS AND PASTIMES.

The Manston Sports.

The Manston annual Station Sports were held on June 7 in spite of the fact that the rain fell in torrents the whole morning and only stopped in time for the start of the Sports.

The winners of the various events were as follows:—

INDIVIDUAL EVENTS.

880 *Yards.*—AC. Brown (No. 1 S.S.), 2 min. 9 3/5 sec. *Putting the Shot.*—AC. Jones (No. 9 Sqdn.), 37 ft. 10 in. *High Jump.*—Flg. Off. Downes (No. 9 Sqdn.), 5 ft. 3 in

1 *Mile.*—AC. Brown (No. 1 S.S.), 4 min. 55 2/5 sec. *Long Jump.*—L-AC. Brock (No. 2 Sqdn.), 18 ft. 10 in. 220 *Yards.*—L-AC. Brock (No. 2 Sqdn.), 24 2/5 sec. 120 *Yards Hurdles.*—Flg. Off. Downes (No. 9 Sqdn.), 19 4/5 sec.

440 *Yards.*—AC. Smith (No. 1 S.S.), 57 2/5 sec. 100 *Yards.*—L-AC. Farrell (H.Q. Section), 11 4/5 sec 3 *Miles.*—AC. Brown No. 1 S.S.), 16 min. 11 4/5 sec. 2 *Miles Walk.*—AC. Varley (No. 1 S.S.), 17 min. 41 4/5 sec.

TEAMS.

1 *Mile.*—No. 1 Sub-Sect. (Carps.), Challenge Cup. 440 *Yards Relay.*—No. 1 Sub-Sect. (Carps.). 1 *Mile Relay.*—No 1 Sub-Sect. (Carps.), Ramsgate Town Challenge Cup.

360 *Yards Hurdles Relay.*—No. 9 (B) Sqdn. 2 *Mile Relay.*—No. 1 Sub-Sect. (Carps.), Birchington Challenge Cup. *Tug-of-War.*—No. 2 Sub-Sect. (Fitters).

Long Jump.—No. 1 Sub-Sect. (Carps.). *High Jump.*—No. 9 (B) Sqdn. *Putting the Shot.*—No. 9 (B) Sqdn.

"Victor Ludorum."—L-AC. Brock, No. 2 Sqdn.

Inter-Unit Athletic Cup.—No. 1 Sub-Section (Carps.), 72 pts.; No. 9 (B) Sqdn., 49 pts.; H.Q. Section, 37 pts.; No. 2 Sub-Section (Fitters), 37 pts.; No. 2 (AC.) Sqdn., 12 pts.

THE SHORT-SERVICE SYSTEM.

[*The following article is published because it represents one point of view of the Short Service system. It does not express the Editorial opinion. If anybody can suggest a better way than the present system of maintaining constantly a large Reserve of properly trained pilots who are still young enough to be fit for flying for several years ahead* THE AEROPLANE *will be glad to publish it.*—C. G. G.]

The short-service commission system in the R.A.F. has been the subject of so much criticism that the friends of the R.A.F. are in a continual state of either excusing it or apologising for it. Only those responsible for it can justify it.

Most of the ill-informed criticism of the system is concentrated on its effect on the individual officer who is its so-called victim. This form of criticism was effectively dealt with in a leading article in *The Army, Navy and Air Force Gazette* of June 7, in which the writer points out that not all those who join the R.A.F. are born in poverty. Many of them have private means and join the Service as one might go up to a university—the training is not less adequate. He adds that it is known that large numbers of employers are offering employment to officers ending their short service and that these numbers are increasing.

But the really serious criticism of the system has regard, primarily, to its effect on the Service. Air Ministry Pamphlet 13 of 1927, *Regulations for entry on Short Service Commissions in the General Duties Branch of the Royal Air Force* states:— (1) Officers of the general duties branch undertake the flying, technical, and general administrative duties of the R.A.F. (9) Short-service officers will be employed for a period of five years on the active list, after which they will be required to serve a period of four years in the reserve.

In the first place the system is an extravagant one. The R.A.F. is paying, housing and training, at considerable expense, for five years, and what return does it get? During his first year the short-service officer is undergoing training, and his value to the Service is presumably nil. For three years he is undoubtedly a valuable servant of the State. He has received a useful training at an age when he is most qualified to absorb education, and he is equal to, in many ways, and frequently better than, the Cranwell-trained regular officer.

But in the fifth year, with the prospect of a return to civil life, of starting a fresh career, of finding a new job, continually before him, he cannot be expected to maintain that height of efficiency, energy and keenness which he has held in the previous years.

Needless to say, there are many exceptions. The development of the specialisation scheme in the Service has enlarged his prospects of obtaining a permanent commission, and no doubt many short-service officers go full-out to the bitter end with this prospect in view.

There is also the officer whose future is assured because the training and educational facilities afforded by the Service have qualified him to take up some good job in civil life which is waiting for him because of influence or because he has made exceptional use of his opportunities.

On the other hand, there is always a number of depressed and disappointed short-service officers slacking-off in their last year because they cannot make what is really an apprenticeship into a career.

A system which pays for five years of whole-hearted enthusiasm and only gets three is an extravagant one.

The present system of intensive specialisation improves the prospects of the short-service officer inside the Service, and may add to his equipment for civil life, but it kills *esprit-de-corps*, and leaves the hard-working, conscientious squadron-officer on the shelf. The engineering, armament, wireless and navigation specialist will, by a series of antedates, become a Squadron Leader, but engineering, armament, wireless and navigation do not make a Squadron Commander.

The object of the short-service commission system is the formation of a large reserve of pilots. If it were done away with an alternative method of making a reserve of pilots would have to be found, presumably at the same price. The short-service officers could be partly replaced by permanent officers, giving one permanent commission in place of five short-service commissions.

Increasing numbers of officers are joining the Special Reserve and Auxiliary Squadrons, and one has it on excellent authority that these Special Reserve and Auxiliary pilots are the real hope of the future. They are undeniably keen, they are well trained on Service types of aircraft, and they face military problems from the Service viewpoint.

Flying Club members of military age have not always the first qualification, and certainly do not have the other two, and may therefore be relegated to the last line of possible supply for the R.A.F. Reserve. Unfortunately, owing to the fact that the existence of the subsidised clubs makes learning to fly comparatively cheap, the supply of candidates for the non-regular Air Force is inadequate for its needs.

There is also the minor snag that apart from their annual training the Auxiliaries can only get their experience with Regular Units at week-ends when the Regular Stations are more or less closed down and the full amount of help and instruction is not available.

The real solution to this problem, therefore, seems to lie in an extension of the airmen-pilots scheme. Under this scheme numbers of selected N.C.O.'s are taught to fly. At the end of five years they revert to their trades, and, unless during their period as pilots they also work for promotion at their original trades, they revert at their old rank.

Here again there are a few exceptions who get commissions from the ranks and start as Pilot Officers on probation. But the majority revert to their trades and the rank they held in that trade. These usually highly-skilled and qualified pilots, among them some of the best pilots in the R.A.F., eventually leave the Service and go into the Reserve as fitters, riggers, carpenters, and so on. If and when they are called up as Reservists it is in their respective trades and they get no Reserve training as pilots and do not form part of the reserve of pilots.

If the number of airmen trained as pilots were increased, and if at the end of their training as pilots they reverted to their trades, but with annual refresher courses in piloting, and annual flying training during their Reserve service, they would form a valuable addition to the reserve of pilots at a very small cost.

It may be argued that by thus increasing the reserve of pilots the R.A.F. would be depleting its reserve of skilled mechanics, but with the prospect of a career which adds a pilot's qualifications and plenty of flying experience to the known advantages of the training of an aircraftman in the R.A.F., recruits would not be so hard to find as they are to-day.—C. M. MCA.

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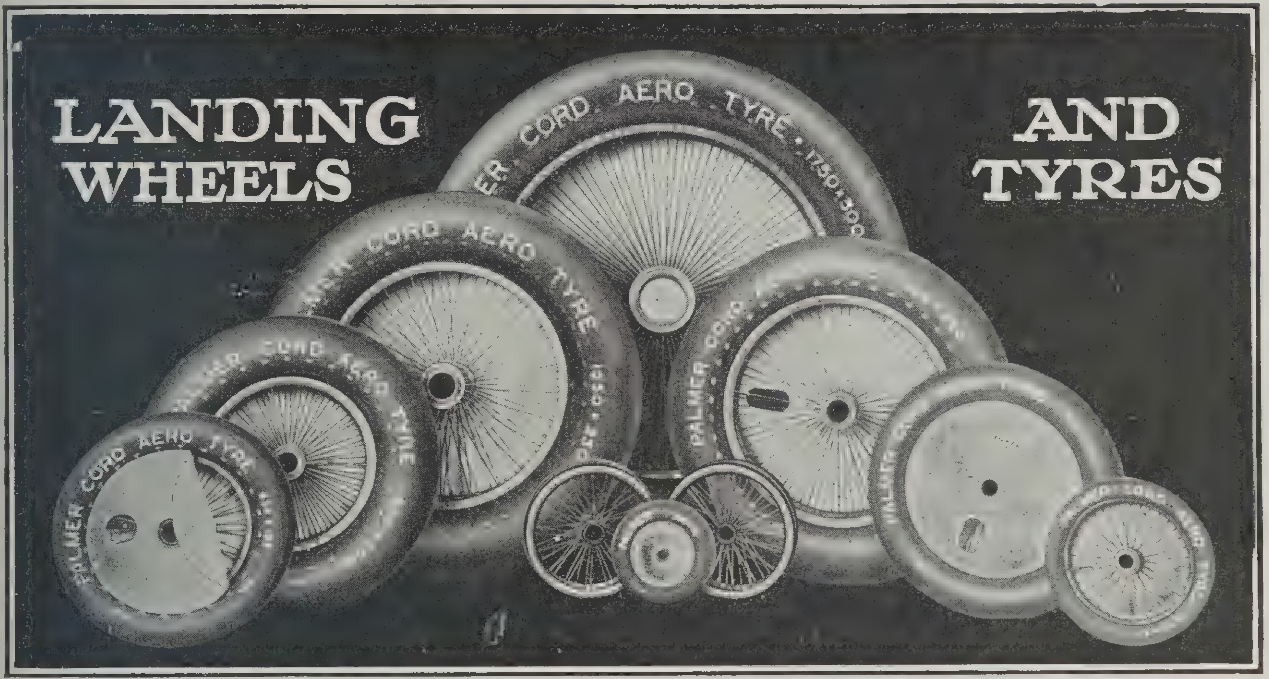

STANDARD SIZES.

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
375×55	168	111.12	25.4	Central
300×60	16	111.12	25.4	Central
450×60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575×60	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	90	150.	38.09	Central
650×65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600×75	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
700×75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132 46
,,	101	178.	31.75	132/46
700×100	77	178.	44.45	132 46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132 46

Tyre Size	Wheel No.	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
700×100	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
650×125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
750×125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800×150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000×150	167	185.	55.	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60

Tyre Size	Wheel No	Hub		Track Line
		Length	Bore	
		m/m	m/m	m/m
1000×150	210	185.	60.32	Central
1000×180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900×200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100×220	134	220.	66.67	Central
,,	136	250.	80.	Central
975×225	192	185.	60.32	Central
,,	194	185.	55.	125/60
1250×250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500×300	115	304.8	101.6	Central
,,	126	304.8	152.4	Central
1750×300	159	400.	152.4	Central
,,	191	350.	150.3	Central
1750×350	193	400.	125.	Central

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D/ND

(365)

TO SOUTH AFRICA AND BACK BY MOTH.

The lecture by Lieut. Bentley, M.C., A.F.C., of the South African Air Force, given before the Royal Aeronautical Society on June 1, was much more a general description of his flights to and from South Africa than had been suggested by the preliminary announcement that the subject was to be the technical aspects of these flights.

Mainly this was due to the fact that both the outward and the homeward flights were almost entirely free from serious troubles or difficulties. The X-type Moth and the Cirrus Mark II engine used reached London in first-class condition, with a minimum of repair or replacement, after having covered nearly 25,000 miles under the most trying climatic conditions. This fact is a tribute to the machine and engine, and even more so to the skill and care of the pilot.

The Lecture.

Lieut. Bentley said that the flights were made possible by the enterprise of the *Argus South African Newspapers,* who bought the Moth for the outward journey and presented it to him on the completion of that flight.

The outward flight started from Stag Lane on Sept. 1, and ended at Cape Town on Sept. 28, 1927, after a total flying time of 121 hours 45 mins. From the journalistic viewpoint this flight was devoid of incidents of particular interest. There was no engine-trouble, the planned destination was reached each day.

The return flight was an unpremeditated one. Mr. Bentley was married in February, 1928, and he and Mrs. Bentley had decided to make a flying honeymoon trip to Victoria Falls. Lady Heath, who wished to fly from the Cape to Cairo, wrote to Mr. Bentley asking for information and help, and it was arranged that the honeymoon trip should be combined with the giving of an escort to Lady Heath over the Forest Belt. Under this scheme Mrs. Bentley was to have been left at Broken Hill while her husband and Lady Heath flew to Tabora. Mr. Bentley was then to return to Broken Hill and rejoin his wife.

At Broken Hill Mr. Bentley had an impulse to carry on and come to England. Mrs. Bentley was quite game, and they came.

Mr. and Mrs. Bentley left Pretoria on Feb. 20 and reached Broken Hill in accord with their original scheme on Mar. 1. They left Broken Hill, in company with Lady Heath, on Mar. 4 and reached Mwanza on Mar. 8. Here Mrs. Bentley contracted a local digestive disorder, and the party had to rest till Mar. 14 while she recovered.

Nairobi was reached on Mar. 15, where a stay was made until Mar. 23, when Jinja was reached via Kisumu. Here Mr. Bentley found steel cuttings in his oil filter, caused by projecting dowel-pins in a big-end bush, which fouled the crank-pins. With the help of an ex-R.A.F. mechanic, the engine was taken down, the offending dowel-pins cut down and the bearings re-bedded. The flight was resumed on Mar. 15, but half an hour out oil-pressure had dropped to the minimum permissible value, and mindful of two newly-bedded big-ends, Mr. Bentley returned to Jinja, where the trouble caused by dirt in the oil-relief valve was soon located and cured.

On Mar. 29 Jinja was left once more, and Mongalla was reached.

Khartum was reached without further incident on Mar. 31. Lady Bailey landed at the same city next day, and on April 5 left for the south with Mr. Bentley as escort. They reached Nimule, on the Sudanese border, on April 8, and Mr. Bentley, waving good-bye without landing, turned back to Mongalla on the same day, and reached Khartum once more on April 10.

The Moth was overhauled and tuned-up during the rest of April 10 and on April 11. On April 12 the flight was continued to Cairo, which was reached on April 15. Here a delay of a fortnight was necessary to obtain passports and visas, the Italian visa for Tripolitana being the main difficulty.

On April 21 Abukir was reached from Cairo, and the facilities of the R.A.F. depôt were taken to give the Cirrus engine a top overhaul.

A fresh start was made from Abukir on April 29, and the North African coast was followed right round to Tunis, which was reached May 4. Here the party discovered Wing Cdr. Manning and his Westland Widgeon, Mr. Neville Stack with *The Daily News* Avro Avian, which with Lady Heath's machine and their own completed what was locally described as a *"concours des avionettes."*

From Tunis the Mediterranean crossing to Sicily was made on May 6. This involved only 70 miles across the sea, and as both coasts were visible from mid-way meant little risk of losing the way.

May 8 produced the first forced landing Mr. Bentley has had with this machine. It occurred a few miles north of Rome, and was caused by a broken push-rod. The break was the result of wear in the rocker-arm cup which caused bending and breaking of the push-rod, and, according to Mr. Bentley, he could have prevented it by more careful inspection. The defect was remedied by the wayside, and the journey ended without further incident at Stag Lane on May 12.

Thus ended a flight which was made without premeditation or preparation. When at Broken Hill he decided to fly on to England, Mr. Bentley had cabled the Shell organisation at Cape Town as to fuel and oil supplies. Their reply was that he could carry on. There were three or four places they were not sure about, but he would be able to get supplies everywhere else.

From Pretoria to N'Dola normal supplies of petrol and Shell oil can always be found. At Abercorn, at the foot of Lake Tanganyika, supplies may have to be arranged, but as Abercorn is on a railway there is no serious difficulty.

At Mongalla the only petrol available is Sudan Government petrol containing a red dye which does not suit most carburettors and the same is true at Malakal and Kosti. At Wadi Halfa petrol is available but no oil, and at Sollum supplies must be arranged specially. The price of petrol varies between 6s. and 1s. 6d. per gallon, the average for the whole journey being about 5s. The total cost for fuel and oil for the whole trip would be about £100.

At M'wanza, Luxor and Tripoli it was necessary to pay for the transport of fuel to the aerodromes. Elsewhere no charges were levied on this account.

Except at N'Dola all the aerodromes up to the Sudan are of at least 600 yards x 600 yards and are usable at any time of the year. At N'Dola, between February and October, the heavy rainfall causes very long grass and arrangements must be made to have it cut.

In the rainy season—May to September—the Sudanese aerodromes become bogs after a good shower and are unfit for landing.

Emergency communications along the route were quite good in Rhodesia, fair in the Sudan, indifferent in Uganda, Tanganyika and Kenya, and bad at Abercorn.

Engine spares carried on the journey were two sets of valve springs, two valves, two rocker arms, two push-rods, one carburettor float, one set of float counterweights, two rocker arm fulcrum brackets, and some spare K.L.G. plugs.

Machine spares were two spare inner-tubes, fabric, dope, needles, threads, and an assortment of wire, split-pins, spring washers, etc.

The engine spares used on the journey were one rocker arm bracket, one rocker arm, and one push-rod. The behaviour of the engine was excellent and it did not lose power at altitudes to any extent that was troublesome. In the central part of their journey, taking off from aerodromes 4,000 ft. above sea level, the machine was always off the ground halfway across the aerodrome.

Overheating never occurred and except for the occasion already mentioned the oil pressure was always constant.

The machine had its wings taken off and the centre section trued up at Khartum, and at Catania the forward bolts on the tail-plane had to be tightened up.

The Discussion.

The discussion which ensued was one consisting mainly of questions all of which were answered by Mr. Bentley and therefore do not need to be recorded separately.

Mr. C. C. Walker, of the De Havilland Aircraft Co., said that Mr. Bentley's Moth, loaded at 1,550 lbs. with a 90 h.p. engine, ought, on the usual assumptions, to have had great difficulty in taking off from aerodromes at 4,000 ft. in temperatures of 100° F. It seemed that engines must actually give more power than they were credited with at these high temperatures, and it would be very useful if the lecturer could compare the behaviour of his Moth at altitude with that found at the same load and altitude in Africa.

The Reply.

Mr. Bentley said that the ideal machine for such a trip would differ from that used only slightly. His wife would support him in saying that a more comfortable front seat was desirable. Then the whole of the three-ply on the fuselage should have fabric glued onto it. The top decking of the Moth, so treated, was in excellent condition; the sides, however, were cracking noticeably.

He had sheathed all his control-cables at fairleads and other points of friction with copper sheaths, and he still had the original cables with which he had left England.

His daily inspection routine was, examine oil and petrol meters, examine and clean contact-breakers, examine engine bearers and holding-down bolts, examine valve gear and springs, lubricate these and valve stems with graphite and grease, and examine airscrew boss for tightness, and check valve clearances.

The K.L.G. plugs were changed every 10 hours, the plugs removed being cleaned at leisure for use in the next 10 hours. The same two sets of K.L.G. S15 plugs treated thus had taken him to the Cape and back.

The same airscrew was used for both the out and home flight. When examined on arrival in South Africa it was found to be in better condition than the spare.

Navigation on this route was not difficult. Across France and down Italy it was easy. Crossing via Tunis meant a short sea crossing with large places to aim for. He had developed a habit of leaning his cheek against the side of the fuselage and watching some particular object. By observing where it met the leading and left the trailing edge he had developed a knack of estimating drift accurately, and correcting his compass course accordingly.

The Moth itself gave him very little to do. Apart from tightening the tail-plane bolts at Catania, a general tightening up of bolts all round on arrival at Pretoria on the first journey was all that had been needed.

He had had no trouble from white ants. White ants would not come out into daylight, they built a tunnel of dirt which they pushed ahead of themselves when at work, and this tunnel of dirt was always visible on any object they had attacked. He merely looked for this infallible sign of the white ant, but had never seen it. The white ant did not like travelling over steel or rubber, and the tail-skid shoe and rubber tyres were probably a satisfactory protection.

MIDLAND OPEN CHALLENGE CUP

WON BY

CAPTAIN N. STACK

in De Haviland Moth
Cirrus II Engine

USING

SHELL PETROL

AND

GOLDEN SHELL OIL

Standard Golden Shell Oil and Shell Petrol exactly as obtainable from public garages, were used by Captain N. Stack, at Castle Bromwich, Birmingham, in winning the Midland Open Challenge Cup, on June 9th.

The world's leading aviators rely on Shell for power, speed and dependability. Among the great pioneer flights accomplished with the aid of Shell products are—the first West-to-East Atlantic Flight (1919) and the first East-to-West Atlantic Flight (1928).

He had found no deterioration of rubber in the tropics. His shock absorbers seemed as resilient as when new, and the two outer covers on the machine were the original ones. He had had two punctures all told. Thorns were kept off the African aerodromes.

The stretches of country which were really dangerous in the event of a forced landing were those from N'Dola to Tabora (550 miles), and from Malakal to Mongalla (300 miles). There was also the stretch between Benghazi and Sirte (300 miles) on the North coast, where the Arabs were many and unpleasant.

Telegraph communications between Malakal and Mongalla were good, and there was wireless between the Italian stations on the North coast, so that in the event of forced landing on either stretch failure of the machine to arrive would lead to the sending out of search parties.

In Africa it was always advisable to take off in the early morning, get to a height where the air was cool and stop there for the flight. Lower down bumps were bad and it was difficult to climb through the hot air. On the homeward flight he had left Malakal for Kosti at 10 a.m. and met the worst bumps in his experience. After struggling to 3,000 ft a bump would drop them 2,000 ft. By starting early in the morning this trouble was overcome.

It was difficult to compare the performance of the Moth here and in Africa. The difference between normal sea level and a place like Nairobi (8,000 ft.) at equal loads was about equal to the difference between a Moth with normal petrol without spares and tools, and the same Moth loaded to 1,550 lbs. at sea level.

He kept his throttle a little over halfway open during the whole flight whatever the altitude. This corresponded to about 78 m.p.h. at sea level, which fell about 10 m.p.h. high up in the heat of the day. He made no attempt to open up to gain speed.

He had used Shell "Golden," a mineral oil, on the homeward journey. The pressure kept up as well as did a vegetable base oil, it did not stick up the top piston rings, and it had enough viscosity at the highest temperature. His consumption had averaged $1\frac{1}{4}$ to $1\frac{1}{2}$ pints per hour, not bad for an engine of this age with tappet guides worn enough to leak quite a noticeable amount.

They had carried dates, biltong, Oxo cubes and similar sustaining food. Also a rifle, with which no one need starve in Africa.

Whether pilots of less experience should attempt this route was difficult to answer. At least enough common-sense to allow for the effects of altitude and heat was necessary when landing. Violent manœuvres near the ground must be cut out. The best approach to a high altitude aerodrome was a straight glide and side-slip. If the mark was going to be overshot open up the engine and fly round again. An extra five or six miles per hour air speed above that needed at sea level should be allowed for to give a reasonable margin for manœuvres near ground under these conditions.

Private owners should make every effort to learn everything possible about their machines and engines before embarking on such flights. Many failures were due to lack of knowledge and if British aeroplanes were to put up a good show it was up to their owners to give them proper treatment. Consideration for the engine meant a lot on a flight where reliability was essential, and an engine would always respond to careful treatment.

THE INTERNATIONAL LIGHT AEROPLANE MEETING AT ROTTERDAM.

On July 20-22 the Rotterdam Aero Club is holding the first annual International Light Aeroplane Meeting at Waalhaven Aerodrome, Rotterdam.

On July 20 there will be a Rotterdam "Rallye," the object of which is to attract as many aerial visitors as possible to Rotterdam. Competitors must fix their point of departure at least 200 km. from Rotterdam and must time themselves to arrive on the aerodrome as near 16.00 hrs. as possible in a non-stop flight.

The one covering the greatest distance in the shortest time and arriving nearest the zero hour will be adjudged the winner. An extra prize will be awarded to the aeroplane covering the greatest distance irrespective of other conditions. In the evening there will be a dinner in the Club-house of the Royal Yacht Club "De Maas."

On July 21 there will be a Relay Race for teams of three. This will be followed by an exhibition of aerobatics by Herr Fieseler. In the evening there will be a night flying demonstration followed by an entertainment and fireworks.

On July 22 there will be a General Efficiency Competition, in which points will be awarded for speed, altitude, take-off and landing. This will be followed by a further demonstration by Herr Fieseler. The meeting will be closed by a dinner given by the Rotterdam Aero Club.

The competitions will be held under F.A.I. regulations and are limited to light aircraft of 400 kgs. (biplanes) and 350 kgs. (monoplanes) maximum weight. All aircraft must have a full capacity sufficient for three hours at cruising speed.

Although the Club had decided to invite all competitors as guests it has since thought that they would prefer to make their own arrangements. Therefore the Club will make a grant of 75 florins to each occupant of competing aircraft. Free petrol and oil of any particular brand required will be allowed for the competitions and the return flight, and accommodation and the use of mechanics for minor repairs will also be provided without charge. There are no entry fees for the competitions.

Unfortunately the Meeting coincides with the King's Cup Race so that a number of potential visitors will be unable to proceed to Rotterdam. Nevertheless one suggests that British makers of light aeroplanes should make an effort to be represented at this meeting. And some private owners might well fly over on Sunday morning after the King's Cup Race, or might even prefer Rotterdam to Brooklands.

The Rotterdam Aero Club operates a Light Aeroplane Section on the lines of the British Clubs and one feels certain that a very hearty Dutch welcome will await anyone who will avail themselves of the invitation.

Anyone interested should write to the Secretary, the Rotterdam Aero Club, Veerdam 1, Rotterdam, for full particulars. All entries must be sent in before July 19.

A SIMPLE INTRODUCTION TO AERONAUTICS.

["The A. B. C. of Flight." By W. Laurence Le Page. 141 pp. $7\frac{3}{8}$ in. × 5 in. Published in America by John Wiley and Sons, Inc. From The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4. Price 7s. 6d. net.]

This is a book which can confidently be recommended to all those private flyers and would-be flyers who are not engineers or mathematicians, to whom the bulk of aeronautical technical literature is a sealed book, but who yet wish to acquire a sound elementary understanding of how and why an aeroplane is made as it is made and what really happens in the process of flying.

Mr. Le Page is well known in aeronautical circles in this country as a one-time member of the Aeronautical Research Staff of the N.P.L. He emigrated to the United States some five years ago, he was for a time on the Aeronautical Staff of the Massachusetts Institute of Technology, was then for a time technical Editor of *Aviation*, and is now on the design staff of the Pitcairn Aviation Inc., one of the most successful of American civil aircraft constructing firms.

The book opens with a very elementary, but perfectly sound, exposition of the main principles of aerodynamics as they affect the form and general arrangement of a normal modern aeroplane, which should be understandable by anyone of normal intelligence.

This section is followed by a description, in very general terms, of the structure of a typical aeroplane, covering the materials and methods of construction in outline. There is then a very clear outline of the process of learning to fly, wherein the reasons why given movements of the controls produce the effects they do produce.

Finally there is a chapter dealing, in equally simple but illuminating terms, with the principles of working of the petrol engine and its more vital accessories, the carburettor and magneto.

Except for the statement in the section descriptive of a typical aeroplane suitable for private flying, that it will have a welded steel fuselage, and one or two minor evidences of his American experiences, the author has written a book which will be as useful to the British as to the American tyro in Aeronautics.

'IRAQ EXPOSED.

["Royal Air Force Rhymes of 'Iraq." By Flt. Lt. A. E. Vautier, M.C., R.A.F. 34 pages, 7 in. × 5 in. From The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4. 2s. 1d. post free.]

The sixteen topical poems in this little book include some lively verses on the Special Service Officer, the Assistant Provost Marshal, the Principal Medical Officer, Leave, Polo, and Intelligence and other subjects, which go to make up the life of the R.A.F. in 'Iraq. They are well worth reading.

POOR COLONEL LINDBERGH!

["Charles Lindbergh." His Life. By Dale Van Every and Morris De Haven Tracey. 236 pages, 20 illustrations. Appleton and Co. Supplied by The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4. 7s. 6d. net.]

A publishers' note at the beginning of this book states :— "The source of material upon which this account of Captain Lindbergh's career is based, was collected in the United States and Europe by the news organisation of the United Press Association." As the voice of Authority used to say in one's school-days : "*Cela suffit !*"—C. M. MCA.

TESTIMONY.

The finest testimony to the value of *All the World's Aircraft* yet published appears in a review in *Rivista Aeronautica*, the official Italian technical magazine. This review, which takes up nearly two pages, analyses in detail what the current issue of *All the World's Aircraft* has to say about Italian Aviation from the historical point of view, and the reviewer says :—

> All these particulars are most detailed and accurate and taken as a whole they are of such a nature as to give to foreign readers an adequate idea of the development given to aviation in our country, both military and commercial, and also of the relative studies and propaganda. It is logical to assume that also the sections devoted to the other countries, some of which are rather extensive for the larger countries, must truly correspond with the actual facts.

The producers of *All the World's Aircraft* cannot ask for a higher compliment to the value and accuracy of their work.

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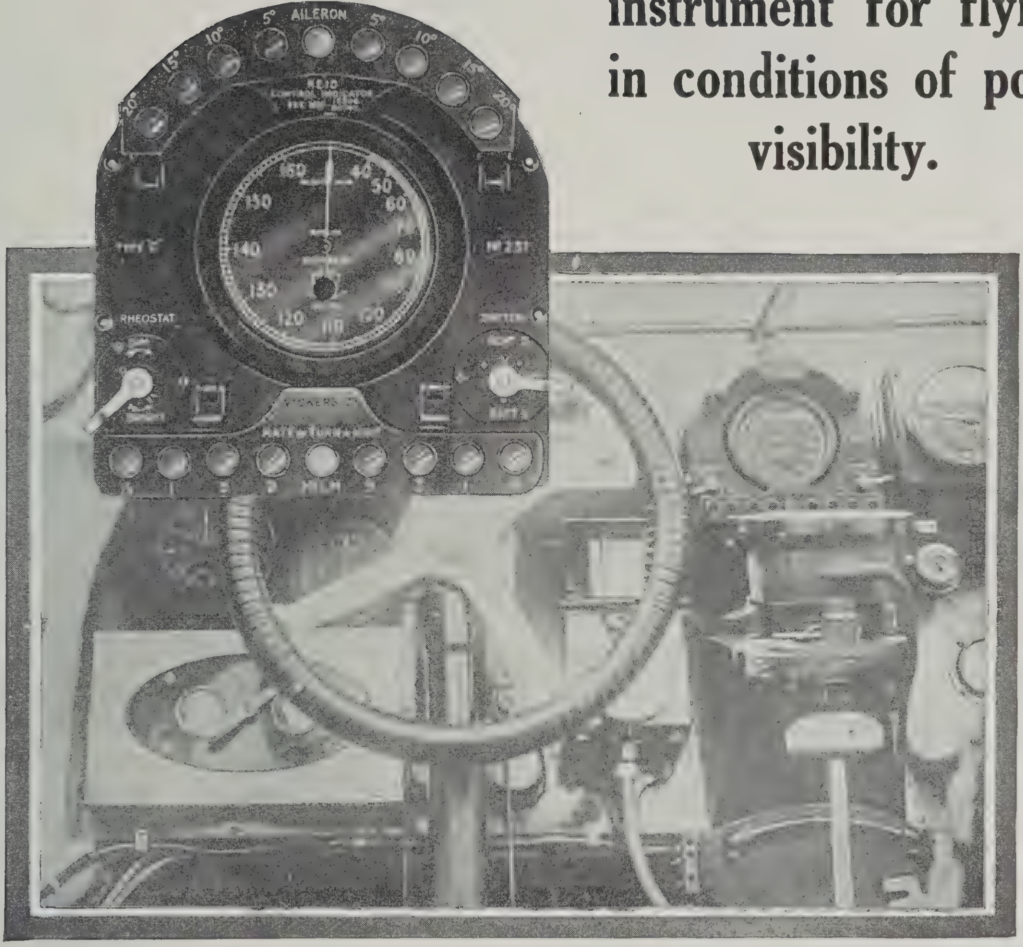

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THE MIDLAND AIR PAGEANT.

The Midland Air Pageant on Saturday last, June 9, may rightly be considered quite a success. The arrangements were good, the events were good and well up to time, considering the howling gale which made taxying difficult and heavy showers of rain which naturally made the competitors reluctant to leave the shelter of sheds or wings and take themselves out into the wilderness. The flying was good, if not sensational to those of us who have attended practically every air meeting since 1909. And there was a fine crowd. The cheaper enclosures were packed though there seemed to be less cars than there were last year.

One hopes therefore that the finances of the Midland Aero Club will benefit considerably. Last year the very large sum which was made out of the meeting went to the Birmingham hospitals. This year one gathers that the Club itself, which did all the hard work on both occasions, will benefit.

The machines, entrants and pilots competing, or demonstrating, were as follows :—

LT, Moth (Midland Aero Club) W. Swann and S. H. Smith;
LW, Moth (Midland Aero Club) R. L. Jackson, R. D. Bednell and W. H. Sutcliffe;
MP, Moth (London Aero Club) E. Stammers, C. H. Craig and F. R. Matthews;
OL, Moth (Hampshire Aero Club) Flt. Lt. F. A. Swoffer;
OO, H.A.C.2 (Halton Aero Club) Flt. Lt. Le Poer Trench;
OS, Moth (Miss S. O'Brien) owner;
OT, Moth (Miss W. E. Spooner) owner;
PT, Moth X (Newcastle Aero Club) F. L. Turnbull and J. D. Parkinson.
QN, Avian (R.A.E. Aero Club) Flt. Lt. G. Thorn;
QP, D.H.53 (A. F. Scroggs) owner;
RE, Bluebird II (Suffolk Aero Club) G. E. Lowdell;
RM, Widgeon (R. G. Cazalet) owner;
RO, Widgeon (R. A. Bruce) H. J. Penrose;
RQ, Widgeon (H. Brooklyn) owner;
RR, Avian III (Lancashire Aero Club) M. A. Lacayo, B. A. G. Neads, J. J. Scholes and A. Goodfellow;
SK, Moth X (Nottingham Aero Club) A. C. Ball and B. Martin.
TB, Bluebird II (Yorkshire Aero Club) G. O. Wood and G. R. Beck;
TE, Parnall Imp (George Parnall and Co.) Flt. Lt. Worsley;
TV, Moth X (Bristol Aeroplane Club) E. W. B. Bartlett;
UF, Moth X (A.D.C. Aircraft Ltd.) T. N. Stack;
UH, Bluebird (Blackburn Aeroplane Co.) A. M. Blake;
VZ, Avian III (Lancashire Aero Club) Miss Winifred Brown;
WI, Moth X (Norman Jones) owner;
XD, Avian (A. V. Roe and Co.) H. A. Brown.
XG, Moth X (De Havilland Aircraft Co. Ltd.) H. S. Broad;
XN, D.H.53 (R.A.E. Aero Club) Flt. Lt. T. B. Bruce;
XT, Moth X (Midland Aero Club), Flt. Lt. Rose;
AIN, Grasshopper (Miss Leathart, Newcastle).

The preliminary heats were flown on Friday and the results were as follows, the figures after the lettering of the machine indicating the speeds done over the course :—

The Inter-Club Trophy (12¼ *miles*).

Heat 1. (1) VZ—80¼; (2) WI—81½; (3) LT—66¾.
Heat 2. (1) PT—80¾; (2) OT—73; (3) LW—74.

The Air League Cup (24½ *miles*).

Heat 1. (1) LW—79; (2) VZ—83½; (3) TB—76½.
Heat 2. (1) RQ—91½; (2) OO—74; (3) LT—74½.
Heat 3. (1) PT—84½; (2) WI—89; (3)QN—90¾.

The Open Handicap (24½ *miles*).

Heat 1. (1) UF—85½; (2) QN—90½; (3) VZ—78½.
Heat 2. (1)WI—83; (2) MP—71½.
Heat 3. (1) XG—85½; (2) TE—89½; (3) AIN—68½.
Heat 4. (1) SK—83½; (2) RE—74¾; (3) RO—84½.
Heat 5. (1) RQ—90½; (2) TV—85½; (3) PT—84.

On Saturday afternoon the first event was the final of the Midland Inter-Club Handicap, open to pilots trained *ab initio* by the Clubs. The winner was Mr. F. L. Turnbull of the Newcastle Club on PT Moth X (Cirrus II), at 80 m.p.h. The second was Mr. Norman Jones of the London Aero Club on WI, his own Moth X (Cirrus II), at 83 m.p.h., and the third was Miss Brown of the Lancashire Club on VZ Avian III (Cirrus II), at 78 m.p.h.

Event 2 was an exhibition of inverted flying by Mr. E. G. Lowdell, the instructor of the Suffolk Club, on a Blackburn Bluebird with an Armstrong-Siddeley Genet engine. This was quite one of the best shows of flying on a light aeroplane that one has seen, especially considering the high wind. And it demonstrated that a side-by-side machine can be used for stunt flying as well as any other. Mr. Lowdell is certainly one of the most adroit pilots in this country.

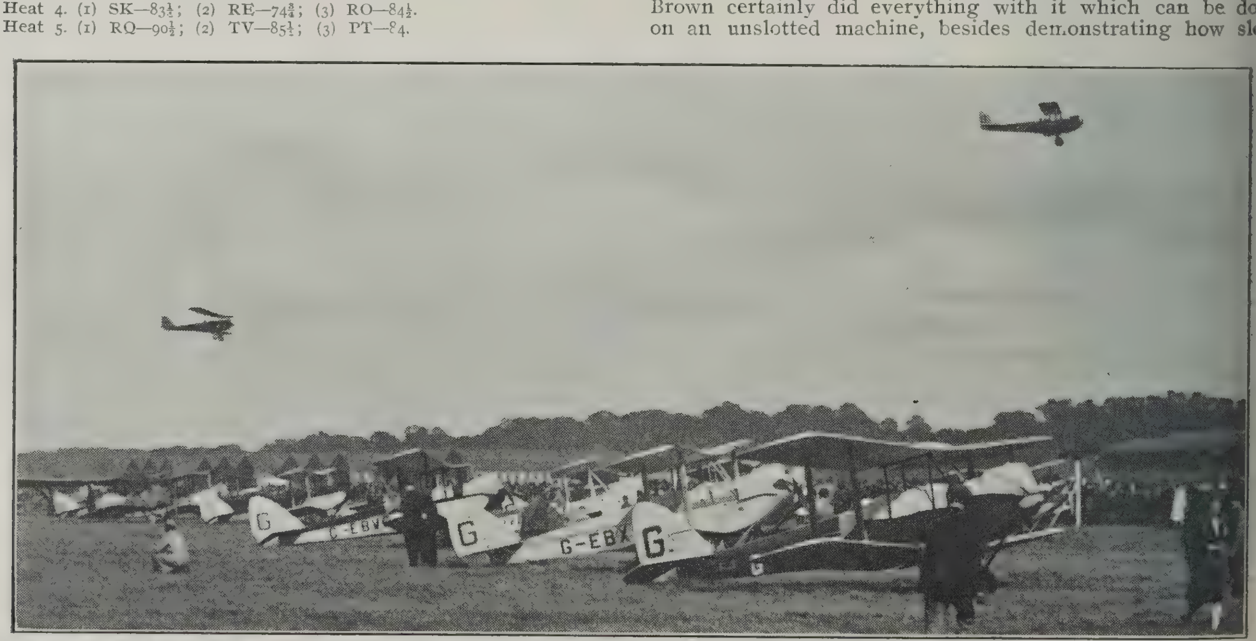
Event 3 was an Instructional Demonstration by Flt. Lt. W. R. Cox, M.C., A.F.C., Adjutant of No. 605 (County of Warwick (Bombing) Squadron, on a Lynx-Avro. This latest development of the old 504K Avro is quite worthy of its predecessors. As a stunt machine the standard training Avro is not exciting, for it lacks the impression of speed given by stunting on a single-seat fighter and it lacks the quickness of action given by stunting on light aeroplanes. Nevertheless, as a demonstration of what an R.A.F. pupil has to do in the course of his training, this was a very good show.

Event 4 was a display of aerobatics by Mr. Neville Stack on the elegant A.D.C. Moth G-EBUF (Cirrus II). This machine, painted a creamy white with red letters, is one of the smartest things in the air at the moment, and, of course, Mr. Stack showed her off to full advantage.

Event 5 was an exhibition of evolutions by a formation of Gloster Gamecocks (Jupiter engines), led by Flt. Lt. A. C. Collier. This was really an astonishingly good show. Considering the high wind the formation-keeping was amazingly close and the looping in formation and looping in line and so forth was clean and neat. Also the landing in formation was much better than could reasonably have been expected in such a wind.

Event 6 was the final of the Air League Challenge Cup open to all Clubs affiliated to the R.Ae.C., paid pilots being excluded. This was won by Mr. "Harold Brooklyn" on Westland Widgeon RQ (Cirrus) at 90½ m.p.h. Everybody was very pleased indeed to see a private owner put up such a good show, more especially as Mr. "Brooklyn" has been a regular competitor at numerous meetings without much success, and has done a great deal of flying in a way which must have increased the airmindedness of the Nation quite considerably. The second was Mr. Norman Jones on WI, his own Moth X, Cirrus II. His speed was 87½ m.p.h., which was 4½ m.p.h. faster than his speed over half the distance in the Inter-Club race. The third man was Mr. R. L. Jackson of the Midland Aero Club on LW Moth, Cirrus I, at 75 m.p.h. A very good performance.

Event 7 was a display on an Avro Avian (Cirrus), by Mr. H. A. Brown, who is now test-pilot for the Avro Company. This machine is fitted with slotted wings and Mr. Brown certainly did everything with it which can be done on an unslotted machine, besides demonstrating how slots



AT CASTLE BROMWICH.— A general view of the machine park at the Midland Air Pageant.—(*"Aeroplane" photograph.*)

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enable a machine to "hover,"—in a wind such as there was on Saturday.

Event 8 was a display of aerobatics by Flt. Lt. Collier on a Gloster Gamecock, Jupiter engine. Here again there is nothing new which can be said about the performance. One can only say that it was quite up to the high standard of flying shown by Flt. Lt. Collier at Hamble. That is to say he made the machine do everything of which it is capable.

Event 9 was a parachute descent by a young woman of unlimited nerve in a Guardian Angel parachute from a machine belonging to the Surrey Flying Services piloted by Mr. Muir. The descent was beautifully judged and was made safely. When the parachute was being folded someone discovered that a small bird had been caught in it. This seemed to cause just as much excitement among those in the immediate vicinity as did the descent itself.

Event 10 should have been a display by the Avro Avenger, but owing to bad weather in the South the machine did not arrive. Consequently, Sq. Ldr. Noakes borrowed an Avian and proceeded to give one of his well-known exhibitions of how it is possible to get an aeroplane into impossible positions and out again.

Event 11 was an exhibition of tank-bombing by four Gamecocks of No. 43 Squadron led by Sq. Ldr. C. N. Low, M.C., D.F.C. The mock-up of the tank was about the safest place within several hundreds of yards of it. Most of the pilots failed to make allowance for windage and nearly all the bombs fell considerably to leeward of the tank. One bomb was dropped up-wind to windward, and the fuse-cap or some other part of it ricocheted off the aerodrome in the direction of the crowd. Fortunately it was stopped by the fuselage of the Handley Page Hampstead which had been sent by Imperial Airways to give joy-rides. Also, fortunately, the flying fragment missed the longerons, struts and bracing of the machine, merely making a hole in the fabric and sticking in among some luggage.

Event 12 was a balloon-bursting competition. This is always interesting to those who can appreciate clever flying, and it really is a first-class test of the ability of pilots and of the relative view from different types of machines. Unfortunately one omitted to note the results.

There was no Event 13 in the programme,—presumably because the promoters were afraid that it might be unlucky.

Event 14 was a display of the slotted wing by Mr. Hubert Broad on a Moth. Here again there is nothing new that can be said about the performance. Thanks to the high wind Mr. Broad was able to hang on his skyhooks and float successfully backwards across the aerodrome, which seemed to impress the crowd immensely.

Event 15 was the final for the Midland Open Challenge Cup. This provided an uncommonly good race. Mr. Martin, of the Nottingham Club, was leading at the end of the first lap, with Mr. Stack (who had passed Mr. Broad) second, and Mr. "Brooklyn," on the Widgeon, behind, but evidently making up time. At the finish Mr. Stack won by a matter of a second or two, with Mr. Martin second and Mr. "Brooklyn" third. Mr. Stack's speed was 88½ m.p.h.,—wonderfully good for a Moth, considering the weather.

Mr. Stack has evidently been performing some magic on his engine. His win was very popular, for he is one of the hardest workers and one of the best performers among our pilots to-day.

One was glad to see Mr. Martin put up such a good show and to have this evidence that the Nottingham Club still exists. Mr. Martin, in years gone by as a joy-ride pilot, did a lot to popularise aviation, especially on the East Coast. But since he become an instructor to the Nottingham Club he has almost faded into oblivion, owing to that Club's curious reticence about its doings so far as the Press is concerned.

When one knew the Midlands well it was not the habit of Nottingham thus to hide its merits, and judging by the flare-up in the Nottingham papers when The Aeroplane ventured a few gentle criticisms a year ago, Nottingham is still as touchy as ever about its reputation. Consequently this modern modesty seems rather out of place.

When Mr. Broad landed he said that one of his slots had jammed open in the air and naturally caused considerable loss of speed. Also he remarked that the machine was bouncing about so much in the air that he had to hold himself onto his seat with one hand and control the machine with the other. One can imagine that a slot jammed open might play some quite funny tricks with the general behaviour of the machine. Anyhow, the slot unjammed itself after a while, for it was working all right when he landed.

Event 16 was a very pretty display of aerobatics by Mr. Penrose on a Westland Widgeon.

Event 17, which one did not stay to watch, as one had to return to London by road, was a display of wing-walking and similar acrobatics by the Surrey Flying Services.

Event 18 was the bombing of a fort by No. 605 County of Warwick (Bombing) Squadron, under Sq. Ldr. J. A. C. Wright. One gathers that the flying of the squadron was quite good, and that the fort blew up obediently to orders.

A DEMONSTRATION.—Mr. H. A. Brown demonstrating a slot-winged Avian (Cirrus).—(*"Aeroplane" photograph.*)

Altogether it was a very good meeting, though, as one has said, nothing sensational happened, and there was nothing new to report.

At about tea-time a pleasant little ceremony took place in the tent which was set apart for the Lord Mayor of Birmingham and the specially honoured guests of the Club.

Shortly after the Club was formed, the brothers Graham who are the proprietors of *The Wolverhampton Star*, presented a Moth to the Club. In recognition of this gift the Club presented at tea-time on Saturday to the brothers Graham a silver replica of the Moth which they had presented to the Club. The model is an excellent example of that highly skilled silversmiths' work for which Birmingham is justly famous, and the presentation itself was an excellent example of that kindliness and friendliness which one knows from experience is as prevalent in Birmingham as is skill in handicraftmanship.

The presentation took Mr. Graham quite by surprise, and in a very neat little speech he explained how, although Wolverhampton itself had no facility for flying, in spite of its having organised in a small park well sheltered by trees one of the very first air meetings in this country, the people of Wolverhampton were quite as keen on aviation as were the people of Birmingham and were willing and anxious to help in every way the splendid work done by the Midland Aero Club in training pilots and in generally increasing the air strength of the Nation.

May the Midland Counties long continue their good work.

C. G. G.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: Harold Perrin, 3, Clifford Street, London, W.1.]

Report for week ending June 10.

Flying Time 24 hr. 20 min. *Instruction* 15 hr. 30 min. *Soloists* 8 hr. 50 min. *Instruction.—With Mr. S. L. F. St. Barbe*—Miss Wilson, Miss V. M. Cholmondeley, Messrs. C. W. Bonniksen, H. Greenland, H. Sutton, A. J. Millar, B. L. Middleton, P. A. Wills, C. Reilly, J. R. Rymill, J. J. Hofer, G. W. Hall, C. N. Green. *With Mr. F. R. Matthews*—Miss H. Cholmondeley, Miss V. Cholmondeley, Messrs. J. A. R. Stroyan, G. E. Clair, P. A. Wills, C. W. Bonniksen, E. H. Thierry, S. Blythe, E. Davis, Dr. Cook. *Soloists.*—Messrs. P. W. Hoare, J. C. V. K. Watson, A. J. Millar, B. L. Middleton, R. Sanders Clark, E. R. Andrews, N. J. Hulbert, J. J. Hofer, F. C. Fisher, G. W. Hall, H. B. Michelmore, Dr. Cook.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending June 8.

Flying Time 24 hr. 9 min. *Instruction* 11 hr. 40 min. *Soloists* 7 hr. 45 min. *Passengers* 3 hr. 20 min. *Tests* 1 hr. 24 min. *Instruction.—With Mr. Baker*—Miss Baerlein, Messrs. Chart, Goss, Garner, Sellers, Brooking, Benson, Stross, Taylor, S. Faulkner, Weale, Mehta, Twee-

BLACKPOOL AIR PAGEANT

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Closing dates for entries, June 15th. Entry forms and all particulars from Major A. Goodfellow, 6, Brown Street, Manchester.

First Inter-Club Instructors' Aerobatics Contest.

Exhibition items include a wonderful display by the R.A.F. (Home Defence Area), Aerobatics by World-famous Pilots including Gerhard Fieseler, Parachute Descents, Fly-past of Famous Pilots, Novel Set-piece, Comic Flying, Aircraft Park, where machines of special interest will be on view, etc., etc,

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dale, Mason, Agar, Greenhalgh, Pattreioux, Kay Taylor. *Soloists.*—Messrs. Garner, Harrison, Mills, Tweedale, Sellers, Chart. *Pilots.*—Messrs. Meads, Davison, Caldecott, Brooking, Hardy, Ruddy, Crosthwaite, Agar, Cohen, Heath, Lacayo, Hall, Scholes. *Passengers carried.*—6.

During the week Messrs. Garner, Sellers and Chart carried out successful first solos, while Mr. Harrison did his height test.

This week's crash was quite exciting. While Mr. Baker was giving instructions in landings his pupil hit a bad patch of ground on the aerodrome with considerable force. Carrying straight on into the air after the bump Mr. Baker instructed his pupil to fly straight and level while he had a look at the undercarriage. His inspection revealed that one wheel was swinging loose and the other appeared to have folded back under the wing. Mr. Baker then took over control and succeeded in landing without turning the machine over—a very creditable performance.

Entry forms in respect of the Lancashire Aero Club Meeting at Blackpool have been sent to all aircraft firms, clubs and private owners of whose address we have knowledge. At the Midland Aero Club meeting on Saturday, however, two pilots were discovered anxious to enter who had not received their forms. If anyone wishes to enter and has not received a form will he please communicate with Alan Goodfellow, 6, Brown Street, Manchester, immediately as the closing date for entries is fixed for Friday, June 15.

The Newcastle-upon-Tyne Aero Club.

[Sec.: J. T. Dodds, Cramlington Aerodrome, Northumberland.]

Report for week ending June 10.

Flying Time 15 hr. 30 min. *Instruction.—With Mr. J. D. Parkinson*—Messrs. Nicholls, Dodds, Lloyd Brown, Alton, Hayton, Jackson and Miss Trevelyan. *Soloist.*—Mr. G. R. Jackson. *"A" Pilots.*—Mrs. Heslop, Messrs. C. Thompson, W. B. Ellis, R. N. Thompson, A. H. Bell, W. L. Runciman, J. Lloyd Brown, F. L. Turnbull, C. Wilson, P. F. Heppell, F. H. Phillips, Dr. Dixon, Dr. Alderson. *Passengers.—With Mr. C. Thompson—*2. *With Mrs. Heslop—*1. *With Mr. J. D. Parkinson—*2. *Tests* 45 min.

On June 6 the Club sent two Moths, accompanied by Miss Leathart flying her Grasshopper, to the mouth of the Tyne on the occasion of the visit of Sir Alan J. Cobham. Some excellent photographs were obtained, and the Club was represented at a Civic Luncheon held in the Mansion House, Newcastle.

We are pleased to report the success of Mr. F. L. Turnbull, who secured the Inter-Club Challenge Cup at the Midland Meeting on Saturday last.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, The Aerodrome, Hamble.]

Report for week ending June 10.

Flying Time 21 hr. 45 min. *Instruction* 4 hr. 30 min. *"A" Pilots* 13 hr. 15 min. *Soloists* 2 hr. 50 min. *Passenger Flights* 50 min. *Tests* 20 min. *Instruction.—With Flt. Lt. Swoffer*—9. *Passengers carried.*—4. *"A" Pilots.*—3. *Soloists.*—6.

We have only had one-and-a-half flying days at the Club this week. High winds have made flying impossible on the other days.

Mr. Kerry carried out his first solo on Wednesday. Mr. Westlake's name was omitted from a former report. He did a most successful first solo, and is now well on the way to his "A" Licence. Our machine was not successful enough to carry off any prizes at the Midland Club Pageant. Mr. Hayter certainly did his best, for having lost sight of his bunch of balloons in the bursting competition, saw a bunch he thought was his, and proceeded to knock the wind out of them. Unfortunately for him, they had been sent up for Miss Winifred Brown, so he got no marks!!

We shall be very glad to welcome Mr. Schreiber again. We have forgotten all about his episode with the Avian and the enclosure posts.

The Norfolk and Norwich Aero Club.

[Manager: Basil Young, The Aerodrome, Sprowston.]

Report for week ending June 10.

Flying Time 10 hr. 55 min. *Instruction.—With Mr. Young*—Messrs. E. Varden Smith, N. Lindley, A. J. K. Finch, A. Cooper, H. P. Clarke, H. Cator, F. Rinder, F. W. Palmer. *Soloists.*—Messrs. E. Varden Smith, R. T. Harmer, G. Barker, N. Brett, H. Mack, H. Pank, E. Lambert, R. F. Pottes, W. P. Cubitt. *Passengers carried.*—8.

Weather again unsettled in the extreme and flying washed out. It's a very unpleasing state of affairs, especially when the machines are serviceable. If anything goes wrong with a 'bus it's always fine and members always came up in regiments to use the other.

The First General Meeting was held on June 8 and a very good report of the year's working was given. The progress of this Club has been printed here before and we do not wish to harass the readers with it all again. However, experience tells us even in so short a time that in Light Aeroplane Clubs it does not do to "Rest on the oars," one plane must keep pulling all the time and it's only real good, solid team work that will bring in anything like the results anticipated.

The deepest sympathy is extended to our Chairman, Capt. A. A. Rice, M.C., and his family in the sad loss they have sustained through the death of Miss A. L. Rice, who was Sheriff's Lady for Norwich last year. In that capacity she became very popular in whatever she undertook. As a member of this Club she will be sorely missed, especially on the Social Committee, of which she was a very active member and earnest worker. The Club has been grateful to her for the many gifts she has from time to time bestowed, and we feel we have lost a real friend.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending June 9.

Flying Time 23 hr. 25 min. *Instruction* 16 hr. *Soloists* (*under instruction*) 1 hr. 10 min. *Soloists* 2 hr. 10 min. *Passengers carried*—7 *flights.*—2 hr. *Instruction.—With Mr. Bartlett*—Messrs. Clarke, Amory, Peters, Davis, Allinson, Lynas, Jellicoe, Keeling, Hughes, B. Bathurst. *With Mr. Tratman*—Messrs. Keeling, Button, Stephens, Singh. *With Mr. Alliott*—Mr. Hughes.

We wish Mr. A. E. Alliott, one of our members, the very best of luck in his voyage in the "Princess Xenia."

Fair weather has enabled us to get in a good amount of flying in the week, but the last three days have been attended by violent gales.

Cinque Ports Flying Club.

[Hon. Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

Report from May 29 *to June* 4 *inclusive.*

Flying Time 22 hr. 25 min. *Test Flight* 5 min. *Instruction.—With Mr. Clarke*—Mr. Maurice Braddell, Mr. Cattell, Cdr. Gubbins, R.N., Mr. Douglas, Mr. R. Dallas Brett, Comdt. Mary Allen, Miss Tagart, Mr. Edgson Wright, Mr. Story, Capt. Took, Mr. Faraday, Capt. Little, Mrs. Twaites. *Passenger carried.—With Mr. Clarke*—1. *Joy-rides.—With Mr. Clarke*—Mr. Pretorius, Mr. Robinson, Mr. Hill, Mrs. Harris, Mr. Simmonds. *Soloists.*—Mr. Edgson Wright, Mr. R. Dallas Brett.

The Club is steadily speeding up its flying time, and June 3 was our best record to date, when we put in 7 hr. 40 min. with our one machine.

On June 4 Lady Heath chartered our Moth to fly over Folkestone to escort the Chrysler Car Expedition from the Cape to London, which she had last met at Abercorn, Rhodesia. Mr. Clarke landed her in a field near Ashford, alongside the main road. The cars picked her up and took her on to London.

On June 4 the first two members went solo. In the morning Mr. Edgson Wright, of Ashford, who was a pilot in the War but had not flown since 1917, did a good first solo on the Moth, and in the afternoon our first *ab initio* pupil, Mr. R. Dallas Brett, did 20 minutes' solo, after 5 hr. 20 min. dual.

Report from June 5 *to June* 10 *inclusive.*

Flying Time 7 hr. 55 min. *Test Flights* 20 min. *Instruction.—With Mr. Clarke.*—Cdr. Gubbins, R.N., Mr. R. Dallas Brett, Mr. Douglas, Mr. West, Capt. Took, Mr. Edgson Wright. *Joy-rides.—With Mr. Clarke*—A. N. Other. *Soloists.*—Mr. Story, Mr. Edgson Wright, Mr. R. Dallas Brett.

The weather interfered considerably with flying during the week, and over the week-end there was a 45-mile-an-hour wind and very bad bumps, so that our total flying time for the week is the poorest yet recorded. However, our second *ab initio* pupil, Mr. F. E. Story, of Hythe, flew solo after eight hours' dual instruction.

On June 6 Mr. K. Edgson Wright flew over with Mr. Clarke to the Ashford (Kent) Golf Links and landed on the fairway of the thirteenth hole. They played a few holes, and surveyed the links from the aviating point of view. These links have excellent landing facilities for light aeroplanes, and should become popular with private owners in the future. [Perhaps the private owners may not be so popular with the golfers.—ED.]

In the early hours of Sunday morning a considerable number of members visited the aerodrome to see the Duchess of Bedford off for India in the Fokker F.VII with Bristol Jupiter engine, piloted by Messrs. Barnard and Alliott. Their take-off was most unpleasantly exciting as they ploughed through the telegraph wires on the south boundary of the aerodrome and for a moment it was touch and go. Fortunately it ended in "go."

The Edinburgh Aero Club.

Mr. David A. Fairley, C.A., 3, Palmerston Place, Edinburgh, has been appointed secretary of the Edinburgh Aero Club in room of Mr. Thomas J. Connolly, B.L., Solicitor, Leith, whose duties as organising secretary have now come to an end.

At a meeting of the Club held recently it was agreed to instruct the secretary to thank Mr. Connolly for what he had done in initiating the club and putting it on its feet, and also to extend a welcome to him to any meeting or function held in connection with the club in the future.

Mr. Connolly is at present promoting a Private Aeroplane Owners' Association, and is also interested in the formation of a commercial aviation company.

FLYING SCHOOLS.

The De Havilland Flying School.

Report for week ending June 10.

Flying Time 109 hr. 5 min. *Instruction—Dual* 37 hr. 10 min. *Soloists* 34 hr. 55 min. *Other Flying* 37 hr.

The week has been rather uneventful, except for one excellent first solo.

Several new pupils have joined the school, including an Indian baronet, Sir Chinubhai Madholal Ranchhodlat, who was so delighted with the Moth that he immediately placed an order for one.

Ten new Moths were tested during the week, so keeping our delivery programme up to date.

A new D.H.61 made its maiden flight, and has now been despatched to Canada.

A great deal of time is being spent in carrying out time tests for Messrs. Rolls-Royce Ltd. on their latest engine, which is fitted in a D.H.9A machine.

Over the week-end Moths were very much in evidence at The Midland Aero Club Meeting at Castle Bromwich Aerodrome, and scored notable successes.

The Henderson Flying School.

[Managing Director: Lt.-Col. G. L. P. Henderson, M.C., A.F.C.]

Report for week ending June 7.

Flying Time 37 hr. 10 min. *Instruction.—With Mr. H. D. Davis*—Miss Kidstone, Messrs. Carlos, Anderson, Matos, Crabtree, Bennett, Bellamy, Payne, Saunders, Gillard, Norbury. *With Mr. W. F. Davenport*—Messrs. Matos, Bellamy, Brooks. *Soloists.*—Messrs. Oliver, Crabtree, Allen, Carlos, Payne, Dr. Wall.

The last two dud days of the week have brought the flying time down considerably, but the good work put in during the early part of the week more than compensated for this.

Mr. Carlos made a record on going up to 7,800 ft. and down in under 30 minutes. He has now completed all flying tests for his R.A.C. Certificate. This performance speaks well for the H.F.S. Renault Avro.

Mr. Payne and Dr. Forsyth were sent solo and made the usual H.F.S. three-point landings.

Col. Henderson had some bad luck on Derby Day. He made a forced landing near Cobham and ran into a flock of sheep, killing six and turning his machine complete with photographer on its back. As the surrounding country was a mass of trees, he had Hobson's Choice of a landing ground.

147 passengers have been carried during the week.

Queen of the Air

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D.A. 181

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The Short "Singapore" is the first All-metal Flying Boat designed by British Constructors, and represents developments following the production, by Messrs. Short Brothers, of Rochester, of a metal hu'l to the order of the Air Ministry, in 1924 Sir Alan Cobham used this machine for his African Survey Tour It is fitted with twin Rolls "Condor" IIIA water-cooled engines, each developing 700 h.p. at 2,000 r.p.m., and it can be flown with full load on one engine First flown in August, 1926, it has since undergone successful trials at the M A E E, Felixstowe

A and P Tubes are used

SIR ALAN COBHAM IS TO BE CONGRATULATED UPON HIS WONDERFUL AFRICAN FLIGHT OF SURVEY, AND WE ARE PLEASED TO BE ASSOCIATED WITH THIS ACHIEVEMENT. Sir Alan has telegraphed us to the effect that "all steel tubes fitted to the Short Rolls Royce flying boat stood up perfectly to the trying tests of varying temperatures and great strain."

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OLDBURY BIRMINGHAM

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 13; Monday, 29; Tuesday, 29; Wednesday, 29; Thursday, 33; Friday, 28; Saturday, 31.

Imperial Airways Ltd.:
London—Paris—Zurich; London—Ostend—Brussels—Cologne and return: Machines 78, passengers 693, freight 22 tons.

Air Union:
Paris—London and return: Machines 40, passengers 191, freight 16 tons.

K.L.M.:
Amsterdam—Rotterdam—London and return: Machines 25, passengers 130, freight 6½ tons.

Sabena:
Brussels—London and return: Machines 12, passengers 44, freight 1½ tons.

Deutsche Lufthansa AG.:
Amsterdam—London and return: Machines 24, passengers 46.

Private:
Machines 13, passengers 20.

Total number of trips by British Machines, 89, carrying 711 passengers. Foreign Machines, 103, carrying 413 passengers.

COMPARATIVE FIGURES.

Week ending June 9:
Machines, 192; Passengers, 1,124; Crews, 361; Total personnel, 1,485.

Corresponding week, 1927:
Machines, 157; Passengers, 957; Crews, 258; Total personnel, 1,215.

Corresponding week, 1926:
Machines, 125; Passengers, 717; Crews, 155; Total personnel, 872.

Corresponding week, 1925:
Machines, 117; Passengers, 703; Crews, 181; Total personnel, 884.

Corresponding week, 1924:
Machines, 116; Passengers, 391; Crews, 287; Total personnel, 678.

Corresponding week, 1923:
Machines, 121; Passengers, 378; Crews, 203; Total personnel, 581.

Corresponding week, 1922:
Machines, 106; Passengers, 168; Crews, 135; Total personnel, 303.

Corresponding week, 1921:
Machines, 91; Passengers, 300; Crews, 107; Total personnel, 407.

Corresponding week, 1920:
Machines, 94; Passengers, 194; Crews, 117; Total personnel, 311.

Croydon Notes.

A rumour is current in some circles at Croydon that Imperial Airways have ordered three more Argosies to take care of their rapidly-increasing traffic. So far as it is possible to gather, this rumour is denied by those who should be competent to speak authoritatively for the company.

Imperial Airways, however, is in so many ways so excellent an imitation of a Government department that these semi-official *dementis* may mean anything or nothing.

It is obvious to the meanest intelligence that the present rate of growth of traffic must shortly cease unless the British fleet of civil aircraft is shortly increased beyond the famous number of twenty, and the Short Calcuttas can scarcely help greatly on the routes now at work, so that the rumour—if at the moment unfounded—is probably at worst an intelligent anticipation.

Mr. Van Lear Black has wasted little time in getting back to his usual routine after his return from Egypt. The original H-NADP—rechristened H-NADR after the transference of the first registration to the three-engined machine used on the attempted Cape flight—is again in his service, and on Friday last, piloted by Mr. Geyssendorffer, took Mr. Black and a party to Rotterdam.

Mr. Lowenstein's private three-engined Fokker has also been active this week. Piloted by Mr. Drew, it flew to Brussels and back on Thursday, June 7, and to Paris and back on Saturday.

An interesting visitor during the week was Capt. Hamsik, of the Czechoslovakian Army, who has been spending a spell of leave touring Europe on an Avia B.H.29, with a Walter radial engine. His machine is a two-seater school or touring machine of very straightforward and clean design, very much in the same class as the British light aeroplanes of to-day.

Capt. Hamsik reached Croydon from Paris on Tuesday, June 5, and proceeded thence to Stag Lane, where he demonstrated his machine in the home of all the Moths.

After paying a welcomed visit to the office of The Aeroplane, with M. Hanc, of the Czechoslovakian Legation, he left once more for Brussels, on his way to Prague, on Thursday, June 7.

The Vickers Vanguard, with wheel-brakes, has now had her braking power increased by increasing the operating pressure on the hydraulic gear, tests having shown that such an increase could safely be made without any risk of standing the machine on its nose.

THE CANADIAN AIR MAIL.

A consignment of British mail which left Southampton on June 2 in the *Empress of Australia* was transhipped to an aeroplane at Rimouski and landed at Toronto in the record time of six days, six hrs. 42 mins.

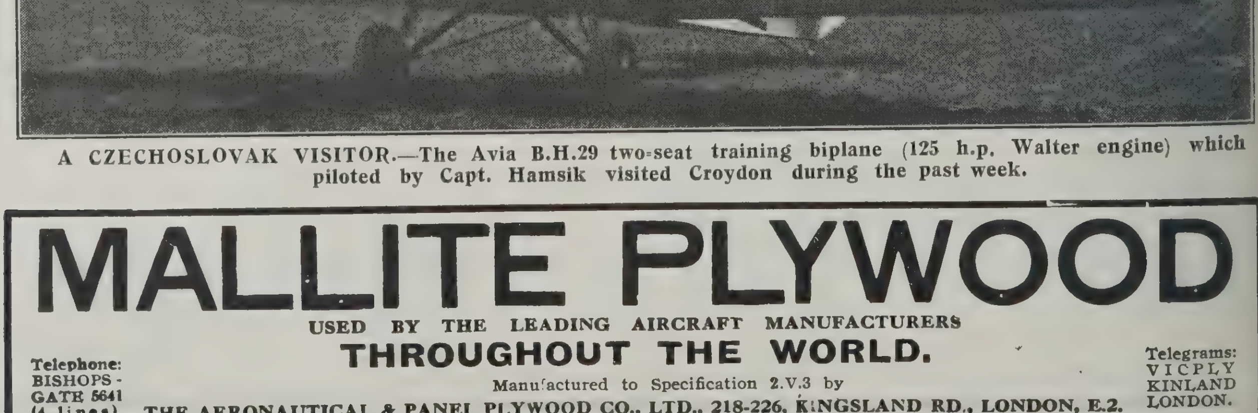
AIR MAILS IN SOUTH AMERICA.

The Postmaster-General announces that unregistered letters and parcels can now be accepted for transmission by the air mail service in Peru to Iquitos and other places on the upper waters of the Amazon.

Such postal packets will be forwarded by the usual route to Lima, thence by train and motor car to San Ramon, on the eastern face of the Andes, and thence by air to Iquitos.

The air mail serves Puerto Bermudez, Contamana and Masisea, as well as Iquitos, and is expected to save nearly three weeks in the transmission of letters as compared with the ordinary route to Iquitos via Brazil and the river Amazon.

Parcels for transmission by this service may not exceed 2 kg. (4 lbs. 6 oz.) in weight, 12 in. by 6 in. by 6 in. in size and cannot be registered. They must be prepaid at the rate of 2s. for the first and 1s. for every subsequent half-ounce, in addition to the ordinary postage rate, must be clearly marked "Servicio Aereo" in the top left-hand corner and should bear the usual Air Mail label.



A CZECHOSLOVAK VISITOR.—The Avia B.H.29 two-seat training biplane (125 h.p. Walter engine) which piloted by Capt. Hamsik visited Croydon during the past week.

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HANDLEY PAGE
AUTOMATIC SLOT CONTROL

"——When the engine was throttled back suddenly during a climbing turn, and the machine was stalled on the turn, it was still possible to raise the lower wing by normal use of the 'stick.' It is this kind of climbing turn that, in conjunction with engine failure or loss of power, has killed so many pilots in the past, and it can be said definitely that the automatic slots have reduced its dangers almost to vanishing point."

"MORNING POST,"
8th May, 1928.

The SHORT "Singapore" 2 Rolls-Royce "Condors"
Cellon Dope.

For the flight of survey round Africa, completed by Sir Alan Cobham, K.B.E., A.F.C., the Dope used on the machine was

CELLON

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C64-66

This notification has reference to a new Air Service opened by the Peruvian Government with Keystone Pronto convertible land or seaplanes (Wright Whirlwind engines) at the beginning of the present year.

TYPE TEST OF THE JUPITER VII ENGINE.

A Bristol Jupiter VII engine fitted with a gear-driven supercharger successfully completed the Air Ministry Type Test trials during May, 1928. This type of engine is designed to develop its full rated output of 420 h.p. at 1,775 r.p.m. at a height of 12,000 ft.

The engine, in accordance with Air Ministry requirements for supercharged engines was tested under conditions which simulated those corresponding to this altitude. That is, the air intake to the carburettors was drawn from a chamber in which the air was maintained at a pressure corresponding to 12,000 ft., and therefore the supercharger was called upon to perform its full duty.

Otherwise the test procedure required follows precisely that required of normal engines.

Power curves taken before and after the 100 hours' endurance test showed a slight increase in output after the test, and after stripping the engine at the end of the whole process showed exceedingly small wear on any of the components, and none at all on the supercharger gears or bearings.

TWO HISTORICAL EVENTS.

Cellon dope has always been largely used in the construction of aircraft since the days when cellulose dope was first introduced to replace flour or sago paste. Consequently there is considerable interest in publishing in this particular issue of The Aeroplane two messages received by Mr. A. J. A. Wallace Barr demonstrating the part which Cellon played in the earliest days of aviation and in the most recent of great performances.

The first is a copy of a letter from A. V. Roe and Co. Ltd., after that highly distinguished firm had only been in existence a few months. Mr. Wallace Barr intimates that this was, in fact, the very first inquiry for Cellon varnish ever received by him. Readers will note that the word "dope" had not then come into existence and that Cellon had not even a home of its own, but had its inquiries addressed to the office of The Aeroplane. This letter reads as follows :—

From A. V. Roe and Co., Brownsfield Mills, Great Ancoats Street, Manchester. 20th Sept., 1911.

To "Ajawb," c/o The Aeroplane.

Dear Sir,—We notice in this week's Aeroplane a few details of your new varnish, "Cellon," and we shall therefore be very pleased if you will kindly send us a few particulars re same, such as the price per gallon, number of gallons required for say 100 sq. ft. fabric.

We enclose a piece of fabric we have been using on the last lot of machines. Will you please treat this so that we can see what it looks like.

For A. V. Roe and Co.
(Signed) H. V. Roe.

The latest manifestation is a telegram from Sir Alan Cobham handed in very shortly after his arrival in London after parking the Short Calcutta at Rochester. It reads as follows :—

Copy of Telegram, 6 June, 1928.

To Ajawb, Richmond, Surrey.

Our wings doped with Cellon long before we started on the Sir Charles Wakefield twenty-three thousand mile flight round Africa last November on the Short Rolls-Royce All-Metal Flying-boat which has been out in the open and exposed to trying conditions of scorching sun of Sudan and tropics combined with tornado storms and damp of West Coast of Africa and on return to England after twenty-three thousand miles' flight the performance of our craft is as good as ever which speaks well for the Cellon Doping Scheme our Fabric being still in excellent condition.

(Signed) Alan Cobham.

This time readers will note that the telegram goes to the Cellon Company's fine works at Richmond and that the message deals with the doping of a machine which is of such size that it probably required about as much dope as would have covered most of the aircraft in England at the time when the first message was received by Mr. Wallace Barr.

Certainly Cellon is to be congratulated on having survived the stress and storm of nearly seventeen years of the British Aircraft Industry.

NEW COMPANY.

British Flying and Motor Services Ltd.—Private Co. Registered May 22. Capital, £1,000 in £1 shares. Objects: To carry on the business of manufacturers and hirers of and dealers in aeroplanes, hydroplanes, airships, seaplanes, flying and motor boats and power-driven launches, motor-cars and cycles, lorries and motor vehicles of every description, etc The first directors (to number not less than 2 nor more than 5) are: Mrs. W. E. Coates, Hopecote, Combe Down, nr. Bath (chairman). H. P. Cochran, The Retreat, Weston Road, Bath, retired army officer. D. B. Hope, Hopecote, Combe Down, nr. Bath, rubber planter. Solicitors: Paterson, Snow and Co., 25, Lincoln's Inn Fields, W.C.2. Registered office: 38, Holborn Viaduct, E.C.1.

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PERSONAL NOTICES.

DEATHS.

BAGNALL-WILD.—On June 2, Maida, wife of Brig.-General Bagnall-Wild, C.M.G., C.B.E.

CRANSWICK.—At Upavon, Wiltshire, on June 5, as the result of a collision in the air, Philip Cranswick, M.C., Flg. Off., R.A.F., and Capt., R.E., R.A.R.O.

Capt. Cranswick served with the Royal Engineers during the War 1914-18 and was awarded the Military Cross. He joined the R.A.F. with a short-service commission in January, 1924, and after a course of flying-training at No. 2 F.T.S., Digby, he was posted to No. 3 (Fighter) Squadron at Upavon.

FUTCHER.—On June 8, near Mosul, 'Iraq, as the result of a flying accident, Sjt. William Frank Futcher, R.A.F.

GARNER.—On June 8, near Mosul, 'Iraq, as the result of a flying accident, Sjt. Alfred Joseph Garner, R.A.F.

McMILLAN.—At Upavon, Wiltshire, on June 5, as the result of a collision in the air, Douglas James Frederick McMillan, Flg. Off., R.A.F.

Mr. McMillan joined the R.A.F. with a short-service commission in January, 1924, and after a course of flying-training at No. 2 F.T.S., Digby, he was posted to No. 3 (Fighter) Squadron. He was due for transfer to the Reserve in September next.

FORTHCOMING MARRIAGES.

GREEN—BERRY.—The engagement is announced of William Edward Green, D.F.C., of St. Ives, Hunts, younger son of the late Mr. H. D. Green, of Leeds, and Mrs. Hull-Ryde, and Cicely, only daughter of Mr. and Mrs. Francis Berry, of 73, Wimbledon Hill, S.W.

IRVING BELL—GREGG.—The marriage between Ronald, son of Mr. and Mrs. Irving Bell, of Denton Grange, Eastbourne, and Dorothy, daughter of Mr. and the late Mrs. R. Russell Gregg, of Buenos Aires, will take place at Stogursey, Somerset, on June 16, at 11.30 a.m.

MARRIAGES.

GRAHAM—BROCK.—On June 5, at Southstoke, Flt. Lt. Strang Graham, R.A.F., to Joyce, eldest daughter of the late James Brock and of Mrs. Brock, Southstoke, Oxon.

SUGDEN—BRAIN.—On June 4, at Llandaff Cathedral, Flt. Lt. Ronald Scott Sugden, A.F.C., son of Dr. and Mrs. Sugden, of Aintree, Liverpool, to Helen Mary Brain, only daughter of Mr. and Mrs. W. H. Brain, of Cwrt-yr-ala, near Cardiff.

WALMSLEY—PIM.—On June 2, at St. Denys Church, Sleaford, Flt. Lt. H. S. P. Walmsley, M.C., D.F.C., son of Mr. and Mrs. Walmsley, of Bexhill, to Audrey Maude Pim, daughter of Mrs. Pim and the late Dr. Pim, of Sleaford, Lincs.

BIRTHS.

BLACKMORE.—On June 7, to Marjorie Vivienne (*née* Saunders), wife of Jack Blackmore (late R.A.F), of Kirby Cross, Essex—a son.

DOWNING.—June 5, at Aspland Nursing Home, Norwich, to Mabel Lilian, wife of F. G. Downing, R.A.F.—a son.

HALL.—On June 3, at Hawksmoor, Windermere, to Dr. and Mrs. R. W. P. Hall—a son.

WILLIAMS.—On June 7, at Kingthorne Cottage, Greens Norton, Towcester, the wife of Sq. Ldr. G. A. Williams—a son.

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AIRMEN OR NOAHS

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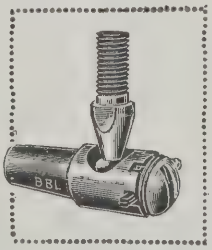

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Aircraft Surplus.—M-L Magnetos 16/3, off Rotary Engines, Singles, new condition, complete; Smith's Revolution Indicators with drives, 22s.; Oil and Air Pressure Gauges 4s. 6d.; Radiator thermometers 10s. 6d.; Airspeeds 10s. 9d.; Altimeters 10s. 6d.; Cross Levels 1s. 9d.; Navigation Lamps, Port and Starboard, 9s. 3d. Above postage paid. Catalogue interesting stock, apply Coley Ltd., Ordnance Works, Queen Elizabeth Road, Kingston-on-Thames. 'Phone 0365.

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Air Survey Company Ltd., 3, Copthall Buildings, E.C.2. L.W. 9850. 39, Grosvenor Place, S.W.1. (Sloane 6048), and Monkey Point, Rangoon.

The Aircraft Operating Co. Ltd., 8, New Square, Lincoln's Inn, London (Holborn 0726) and Bulawayo, Southern Rhodesia: Contractors to the Ordnance Survey. Laboratories and Subsidiary Company for aerial photography in the British Isles, **Aerofilms Ltd.**, The Hyde, Hendon (Colindale 6157).

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Wainwright's Flying Clothing.—Genuine R.A.F. new "Sidcot" flying suits, fitted fur collars, all sizes, 65s. Full chrome R.A.F. pattern tan leather flying coats, £6 6s. R.A.F. Pilot's gauntlet gloves, 10s. 6d. per pair. Flying helmets, fur trimmed, 12s. 6d. Leather breeches, 35s. and 55s. Write for catalogue—Wainwright's, 300 and 302, Euston Road, London, N.W.1. 'Phone: Museum 6280.

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Royal Aircraft Establishment. An examination for the entry of not more than eight Trade Lads will be held on Tuesday, July 3, 1928. Application for admission to the examination must be made on the prescribed form which must be filled in and returned not later than Tuesday, June 26. Application forms and the regulations governing the conditions of entry and training of Trade Lads may be obtained by post from—The Chief Superintendent, Royal Aircraft Establishment, South Farnborough, Hants, or by personal application to the R.A.E. Employment Department.

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JUL 5 1928

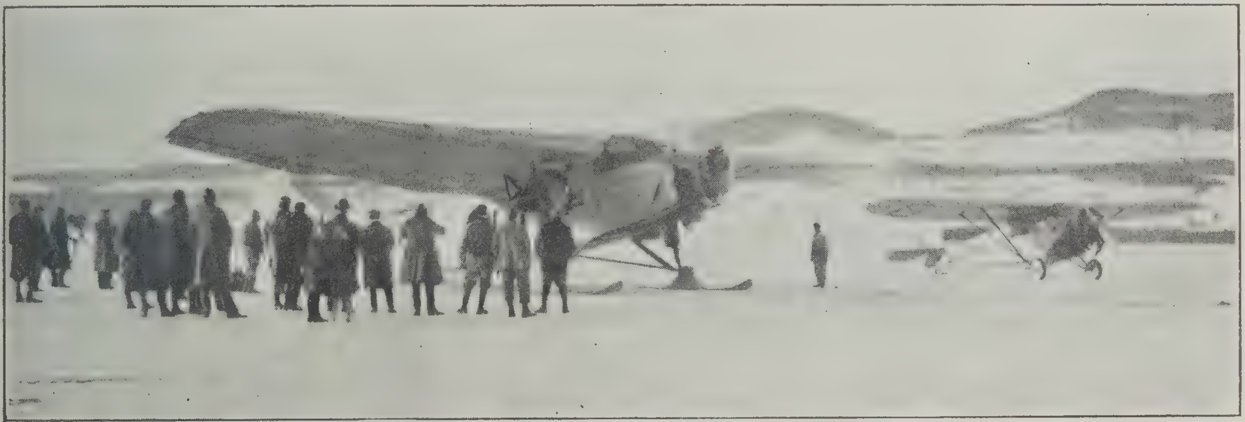
THE AEROPLANE

INCORPORATING AERONAUTICAL ENGINEERING

Edited by C. G. Grey

Vol. XXXIV. No. 25. SIXPENCE WEEKLY. [*Registered at the G.P.O. as a Newspaper.*

"TILL I CAMPED ABOVE THE TREE-LINE—DRIFTED SNOW AND NAKED BOULDERS."—*(Kipling.)*



AN INTERNATIONAL AFFAIR:—A Ford three-engined monoplane and a Fairchild cabin monoplane (Wright Whirlwind engines) at Murray Bay, Quebec, while proceeding to Greenly Island to pick up the crew of the "Bremen."

PALMER LANDING WHEELS AND TYRES

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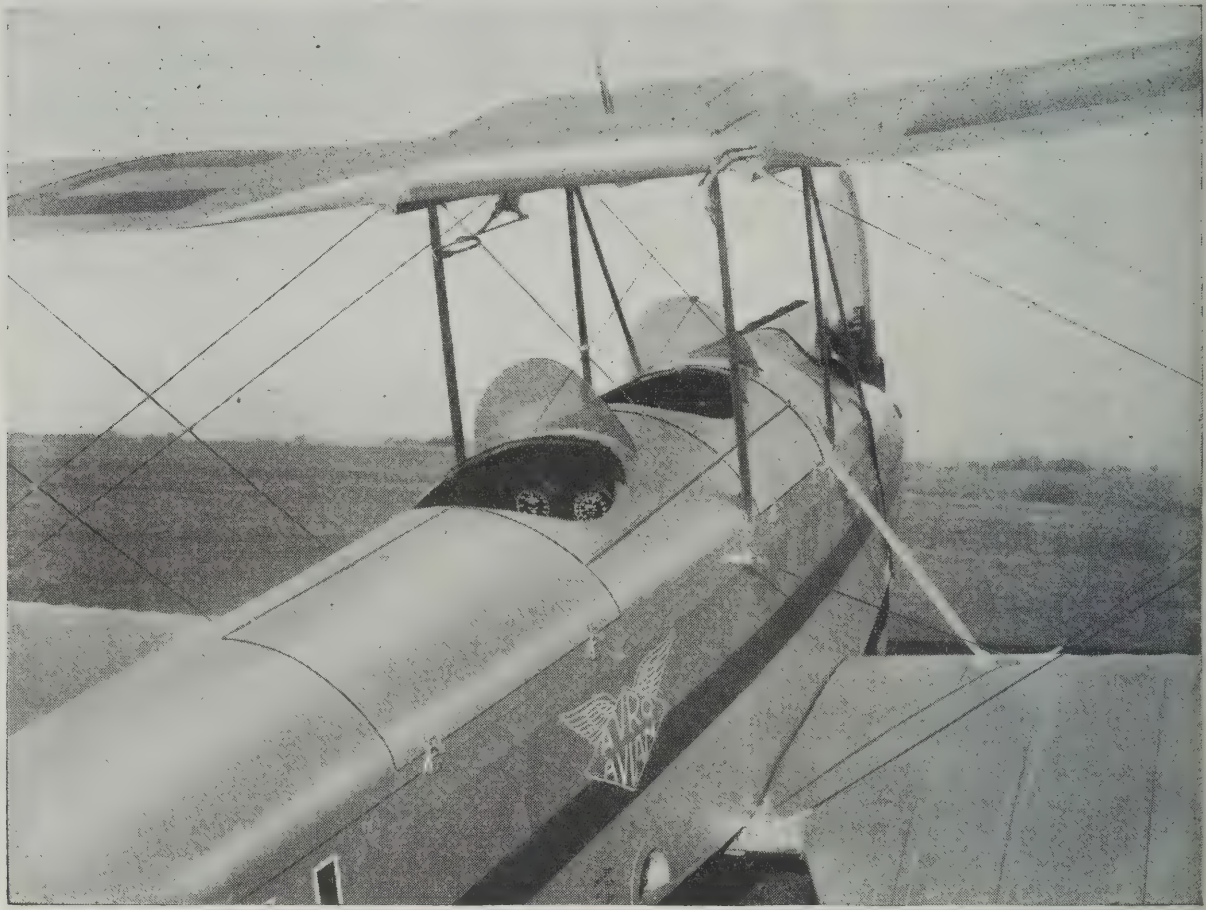

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JUNE 20, 1928.

THE AEROPLANE

Incorporating

Aeronautical Engineering

VOL. XXXIV No. 25.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 04-6.
Subscription Rates, post free: Home 3 months, 7s 6d.; 6 months, 15s.: 12 months 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8s.
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ON WHAT THE WORLD'S MARKETS WANT.

If the British Aircraft Industry is going to capture the World's trade in commercial aircraft, as it can do if it sets the right way to work about it, now is the time to get down to the job, to think out what the World's markets want, and to set to work hard to meet the demands of those markets. Instead of making what we should like to make and then spending thousands of pounds in persuading the Overseas buyer to buy it, the thing to do is to find out what the Overseas buyer wants and then to set about making it.

Another point which deserves the serious consideration of the Trade is the fact that when we come to be faced seriously with American competition, our aircraft firms will have to do things on American lines. We cannot expect the accredited agent of a British aircraft firm to buy a machine for cash himself and fly it all over his particular territory giving demonstrations at his own expense. Nor can we expect buyers in that territory to pay one-third cash with order, one-third cash on shipment and one-third cash on delivery, and then wait anything between three months and twelve months for delivery.

The Aircraft Trade will have to do what the American Motor Trade does. It will have to send out a demonstration machine at its own expense for the use of the agent, and it will have to maintain some sort of a stock in that territory, so that buyers can, at any rate, get their machines when they pay for them. Ultimately we shall have to go further than that and allow credit for machines, or at any rate sell them on easy payment against a proper guarantee.

A BUSINESS PROPOSITION.

Look at it as a business proposition and it is nothing so very alarming. A light aeroplane sells at say £600. Obviously, therefore, it does not cost £600. Putting the profit at quite a moderate amount and cutting out all selling expenses of the ordinary kind it cannot cost more than £500 on the factory floor. Consequently if a firm sends a demonstration machine to its agent, it is merely speculating £500 on getting business in that agent's territory. That is not as much as the cost of sending one of the firm's own representatives to Australia and keeping him there for a month or two, even without an aeroplane.

And, suppose the firm sends four machines as initial stock "on consignment," to remain the firm's property until sold and paid for, it is only laying out £2,000 on getting business in that territory. Which is less than the travelling expenses for six months of a competent man on a trip round, say, South America.

Furthermore, that £2,500 is not outlay, as would be the travelling expenses of the firm's own representative. It is only money lying idle, probably for a month or two at most. The stock machines remain the firm's property until the money is paid for them. And the demonstration machine, unless absolutely destroyed in a crash, can still be sold for £300 or £400 after six months of demonstrating.

Therefore the total outlay in hard cash cannot be more than £200 or £300. And that is about the equal of the cost of sending two or three machines with pilots and mechanics to a few provincial flying meetings in England. To let tens of thousands of pounds of prospective business go because a firm is afraid to speculate a few hundred pounds in this way is sheer commercial insanity. But, unfortunately, combined with our silly policy of trying to sell what we make instead of making what the market wants, it is exactly the kind of insanity which has let the Americans capture the whole of the World's automobile business.

AIRCRAFT TYPES.

The American Aircraft Industry has already shown us fairly clearly the direction in which developments are likely to take place. There has been in the United States a perfect epidemic of cabin monoplanes with 200 h.p. Wright Whirlwind engines carrying three or four passengers and a pilot. That is a good enough type as far as it goes, but it does not fill the whole demand of the markets, any more than does the open two-seater with an 80 h.p. engine like the Moth and the Avian.

Already the Americans and Canadians are discovering that if you ask a 200 h.p. engine to carry four passengers and pilot and luggage and a respectable amount of fuel, that engine has to be kept pulling right up into its collar the whole time. And if an aircraft operator is going to get the best value on his capital outlay on engines he ought not to ask those engines to work full time on more than about three-quarter power.

The result is that the American air lines, especially on night-flying air-mail routes where absolute reliability is more essential than anywhere else, are putting bigger engines into aeroplanes which are only a little bigger and are running engines at only about half-power. For example, the Boeing Company, who are running the Western half of the trans-

SPEED.—The Westland Wizard (Rolls-Royce Falcon XI), said to be the fastest single-seat fighter in the World.

Continental air-mail route, that from San Francisco to Chicago, are now using Pratt and Whitney Hornets of 525 h.p. on cabin machines which only hold four passengers, and 1,000 lbs. of mail load. And other lines which have hitherto used Whirlwinds of 200 h.p. in cabin monoplanes are now fitting Hornets of 425 h.p. in the same machines.

This is quite in accord with American motor-car practice. Whereas we in this country have been accustomed of late years, partly thanks to the horse-power tax and partly for the sake of economy in petrol, to build cars with small-bore high-speed engines, screaming round at a couple of thousand revs. per minute, the Americans have always built large-bore woolly engines which turn over comfortably at a thousand revs. per minute, or less, and are never running at anything like their full power except up-hill or when pulling the car out of bogs or sands.

Power in Australia.

A move in very much the same direction is happening in Australia. In last week's issue of The Aeroplane a photograph was published of a D.H.50 built by the Queensland and Northern Territory Aerial Services Ltd. (Quantas) in their works at Longreach. Its power-plant is a Bristol Jupiter engine of 450 h.p., instead of the old 220 h.p. Puma, for which the D.H.50 was originally designed, or even the 330 h.p. A.D.C. Nimbus, which has been used in some machines of this type.

Naturally, with the Jupiter engine, a D.H.50 is grossly overpowered. But the result in the end must be economy in workshop charges, because that same Jupiter will never be asked to give more than about half its horse-power except perhaps in just getting off the ground, or under some very exceptional circumstances when particularly high speed is required on an urgent flight.

On the whole of this subject one has had considerable enlightenment from Mr. E. W. Percival, who paid a visit to this office one day last week. Mr. Percival, formerly of No. 60 Squadron, R.F.C., and R.A.F., is one of the most successful aviators in Australia. He has been running machines of his own as plain commercial propositions practically ever since he got back to Australia after the War. He has flown all over that Continent, and thanks to his skill as a pilot and his carefulness as an engineer, he has had singularly few accidents, even of minor kinds.

Practically the whole time he has been flying Avros. At first he used Gnomes and Le Rhones, and so forth. Latterly he fitted a 220 h.p. Hispano-Suiza into an Avro and found that with the extra 100 h.p., or thereabouts, he had greater economy in upkeep and a far better performance.

Instead of pulling his engine to pieces after every few hours' flying, to renew odd parts and clean out his cylinders, he found that he could run his Suiza until it had to be taken down to be decarbonised, without having any trouble at all with the working parts. And when he did take it to pieces he found the valves and valve-guides, and so forth, were just as good as when the engine was assembled, simply because nothing in the engine had been over-strained.

Real and Theoretic Height.

Mr. Percival raised one point about commercial flying in the Overseas Dominions which is particularly well worth the attention of manufacturers who want to sell their machines in foreign countries as well as in the Dominions. He said that at Longreach, the Quantas headquarters, which is only 900 feet above sea-level, the heat and the dryness of the air is such in the summer that when the resultant quality, or density, of the air is reduced to what is known scientifically as "standard atmosphere," which represents something like an ordinary fine day in England, it represents a height on the aerodrome of about 5,000 feet.

Which means that an ordinary commercial aeroplane heavily loaded, which might at the start of a long flight be only capable of reaching a service ceiling of 7,000 feet, would practically be unable to get off the ground.

Longreach being so near the Equator is perhaps exceptional, but there are plenty of other places in the World, by no means so near the Equator, where the air is particularly hot and dry, although the actual height above sea-level is nothing much. And manufacturers who want to sell machines in foreign parts ought to take that into consideration.

What this sort of thing means may be remembered by those readers of The Aeroplane who are old enough to remember the start of the famous Circuit of Britain from Brooklands in July, 1911. It was a blazing day, and the sandy soil at Brooklands, surrounded by the cement track, was simply one boiling cauldron of air. The result was that the machines which had got off quite happily with their full load the previous day only barely managed to stagger out of the track, and several of them could not get off the ground at all.

In spite of increased efficiency in engines and aeroplanes of these days, similar conditions may very well happen abroad, although they are never likely to do so in this country.

Fuel Troubles.

Another point raised by Mr. Percival deserves the attention of aero-engine makers. In most of the British Dominions, and in nearly all foreign countries, benzol can only be got at very few aerodromes. And even straight-run aviation spirit is difficult to get.

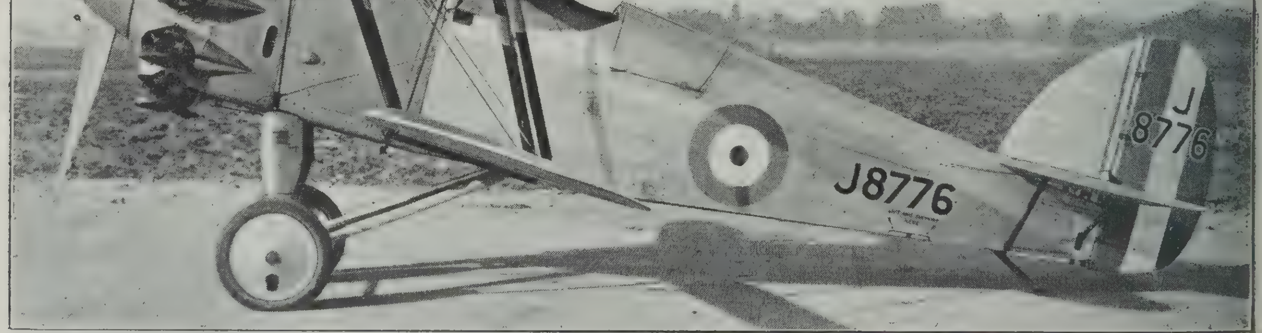
Aviators landing haphazard in odd parts of the World off the main air routes, such as that from London to the Cape and London to Australia, have to put up with ordinary automobile gasoline, and very often the very worst cracked spirit at that. Consequently high-compression engines are not much use overseas. What are wanted are low-compression engines running at high revolutions.

Here again we have a great deal to learn from the United States. Certain American car engines and certain American aeroplane engines, notably the D.12 Curtiss, although their compression is by no means low, will run on bad spirit which in the majority of British engines would pink and crackle and bang so that the engine would practically refuse to run on it.

Without pretending in any way to be an expert in engine design, one may perhaps express the belief that this has something to do with the design of the top of the piston and the design of the inside of the cylinder-head,—otherwise of the whole combustion chamber.

The Airscrew and Gear Problem.

This brings us to another point. Pushing the engine up to high revolutions per minute, with big valves, and so forth,



PRODUCTION.—The Hawker Hawfinch (Bristol Jupiter, supercharged). An altitude fighter of high performance, built on the steel-tube principle, described recently by Mr. Fred Sigrist in "The Aeroplane," which gives simplicity for mass-production equal to that of a Meccano toy.

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The aircraft are flying in formation and keeping to a pre-arranged schedule.

Never before has such an ambitious flight been attempted.

The machines have now reached Australia; 112,000 engine miles having been covered without mishap or trouble.

On such a cruise much depends upon the engine. For this flight, as for so many previous flights where consistent reliability has been required, Napiers were selected—not specially tuned engines but standard engines taken from the stores.

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is certainly one way of getting power. But high revolutions mean small airscrews. And small airscrews are the chief cause of the comparatively low efficiency of most aeroplanes.

Look at some of our single-seat fighters which, in spite of their magnificently efficient engines, are actually 30 or 40 miles per hour slower than the latest things in high-speed bombers. If you stand in front of them you will find there is about a foot of airscrew blade, or less, sticking out on each side of the engine and the enormous fuselage which is built up to the engine because the wind-tunnel experts say that it ought to be done that way.

If only they would cut the fuselage down to a smaller diameter and leave the cylinders sticking out they would get better efficiency. And if they could get another few feet of airscrew outside the engine they would do better still.

The proof of this is the astonishing performances put up by the D.H. Hound and the Competition Fairey III.F when fitted with Napier engines geared much higher than usual and turning very much bigger airscrews. A certain amount of the extra performance was got by running the engine faster. But most of the increase was got simply because the outer parts of the airscrew chew their way through clean air and push it clear behind them instead of merely churning up a bow wave and pushing it straight into the engine and fuselage.

GEARED LIGHT AEROPLANES.

There is a lesson to be learned from this by the constructors of light aeroplanes and those who build engines for them. There is no doubt that Moths and Avians and such things do need more power—in spite of Mr. Stack's opinion to the contrary. As a matter of fact, Mr. Stack was quite right in one way. Better performances could be got with the existing engines if the machines themselves were more highly efficient. But, on the other hand, better performances could be got out of the machines if their airscrews were more highly efficient.

There is nothing much the matter with the airscrews as airscrews. The trouble with the poor little things is that they do not get even half a chance of doing their job.

Stand in front of any light aeroplane with the tail lifted, so that you can get a straight end-on view of the fuselage, and then see how much of the circle of air which is swept by the airscrew is taken up by the fuselage of the aeroplane, and the undercarriage, and the engine and its cowling, and the petrol tank in the centre-section, and the wing, and the wind-screen, and the centre-section struts, and so forth. The poor, wretched little wind-stick must spend half its time and power whacking its slip-stream up against obstructions.

Fit those same engines with gearing, even at the expense of a bit more weight, give the airscrews a foot or more on each blade, run them a bit slower, spin the engine up a bit faster, and then Moths and Avians and things will become entirely different vehicles,—good as they are already.

There is, of course, the trouble that bigger airscrews in existing machines might come so near the ground so as to damage themselves in long grass, or against other obstructions, in landing or getting off. The only remedy, of course, is a taller undercarriage. That, certainly, looks ugly and adds to the head-resistance.

But even a foot or so on an undercarriage will not put on so much added head-resistance as to make any material difference to the efficiency of an airscrew blade. And, anyhow, we must be getting somewhere near the day when we shall have retractable undercarriages which will tuck themselves up neatly under the fuselage when a machine gets into the air.

USEFUL BLADE AREA.

In the meantime, something might be done with longer airscrews of less blade area. Of course one knows that the length of an airscrew, commonly called the diameter (though how a long thin thing like a screw can have a diameter is not quite clear), ought to be approximately equal to the pitch. But when having a proper pitch-to-diameter ratio means pushing the slip-stream into the engine and the fuselage, one cannot help thinking that a better performance might be got out of an airscrew which, although it had a pitch-to-diameter ratio which was all wrong, had, at any rate, enough blade area outside the fuselage to do its job.

In the old days at Brooklands, A. V. Roe and Co. used to have a born airscrew expert named Smith who used to take hold of scientifically-designed airscrews, rush at them with a spoke-shave and carve rashers off them until they were hopelessly wrong theoretically, but increased the performance of the machine enormously. And one would not be at all surprised if some such entirely unscientific methods could be made to improve performances to-day.

TAKING THOUGHT FOR THE MORROW.

If the British Aircraft Industry will only chew over some of these points in its mind it will be much nearer capturing the World's markets for aircraft. Those markets may be only worth a few tens of thousands of pounds at present, but they are going to be worth millions in the end.

The first people who imported the primitive motor-cars of twenty-five years ago to the British Dominions hardly expected to see automobiles as they are to-day running transport all over the plains of Australia, being driven by niggers in Africa, conveying trains of pilgrims in Arabia, and as common as bullock-carts in India. Yet, there were some of us who foresaw even then the possibilities of motor-cars when they were made into reliable and safe vehicles.

One does not say that aeroplanes will ever be as numerous as motor-cars, even overseas, where they have such immense advantages in roadless countries. But one does say emphatically that civil air transport overseas will run into millions of pounds' worth of business per annum and will provide employment for tens of thousands of people running that transport, apart from the employment of hundreds of thousands in the factories where the aircraft are made. Now is the time for the British manufacturers and the British capitalists to make up their minds whether they or our more enterprising relatives on the other side of the Atlantic are going to do all that business, provide all that work, and pouch the resultant profits.—C. G. G.

THE DANGERS OF RADIO-MASTS.

In these days when cross-country flying by civil pilots, many of them amateurs in every sense of the word, is becoming so common everything possible should be done to remove likely causes of avoidable accidents, and one very likely cause of accidents in the future is the number of radio-masts projecting from the landscape all over the country.

One does not suggest for a moment that the masts should be removed, but one does suggest that their presence should be made very much clearer than it is.

Such masts are little danger on a fine day. Any reasonable pilot would naturally be flying considerably higher than the tops of the highest masts,—though in fact there are quite a good many pilots who prefer hedge-hopping. But on a dull day with low clouds, and perhaps drizzling rain, a pilot may very well be flying at a height of only 100 or 200 feet and against a background of black cloud, especially in rain, radio-masts become almost invisible.

Only a week or two ago a pilot flying from Norwich aiming to hit the North-Western Railway as a guide to Manchester, found himself quite dangerously close to the masts at Daventry. Fortunately he saw them in time to do a rapid turn. And in turning he was able to see the position of the other masts so as to get away from the whole bunch of them. But a less experienced or less able pilot might quite easily fly in among the masts, and while endeavouring to dodge one mast he might hit another.

During the War 1914-18, even though there were fewer radio-masts about then than there are now, collisions with such masts did occasionally happen. One officer of the R.N.A.S. came out of a cloud suddenly and rammed a wireless mast at Portsmouth. Fortunately for him the nose of his machine stuck in the lattice girder-work of the mast, and he himself was got down safely by two naval ratings, who gallantly climbed the mast and managed to get him out of his machine, unconscious but not seriously damaged. And earlier in the War an officer who had been chasing Zeppelins at night barely missed the masts at Chelmsford.

What with the increase in the number of masts and the increase in the amount of flying, which is likely to be multiplied many times over within the next few years because of the cheapening of aeroplanes and the increasing interest in aviation, and the possibility of flying in worse and worse weather owing to improvements in the machines themselves, there is a correspondingly greater likelihood of accidents through collisions with radio-masts. So one suggests to the Marconi Company and the Post Office authorities that something ought to be done about it.

The pilot who so narrowly missed the mast at Daventry the other day makes the very simple suggestion that each mast should have a fairly powerful electric light at its top, and perhaps another halfway down, and that these lights should be turned on as soon as the visibility becomes bad.

He points out that every radio station has a dynamo continually running, so that constant electric power is available. Therefore turning on the lights is only a matter of a switch.

This, of course, could be done automatically by some apparatus affected by light, such as that which turns on and off the electric beacon at Croydon. But, without going to the expense of this, it would be quite good enough if the man in charge of the engine-room at the station had orders to switch on the mast-head lights as soon as he found that he himself was unable to see the top of the furthest mast.

This strikes one as being quite a sensible method of judging whether the lights are needed or not, and it also seems quite a sensible method of operation. It involves very little cost for each station, and one suggests that it is a matter which might well be taken up by the Royal Aero Club and the Automobile Association if the Post Office and the Marconi Company do not take action.—C. G. G.

FAIREY

AIRCRAFT

THE LATEST ATLANTIC FLIGHT.

On June 17, at 15.50 hours (British Summer Time), Miss Amelia Earhart, Mr. Wilmer Stultz (pilot) and Mr. Lou Gordon (mechanic) left Trepassey Bay, Newfoundland, in the Fokker seaplane *Friendship* (three Wright Whirlwind engines) and landed at Burry Port, Carnarvonshire, on June 18, at 12.40 hours.

This is distinguished from other successful Atlantic flights by the facts that it is the first to be done on a float seaplane, and that it is the first in which a woman has been carried as passenger. Miss Earhart denies that she piloted the machine.

The *Friendship* was originally the property of Commander Byrd, U.S.N., and was used by him two years ago in his Arctic experimental flights. It left Boston on June 3, and the pilot was forced down by fog at Halifax, Nova Scotia. Trepassey Bay was reached next day.

The original intention was to carry 900 gallons of petrol, but with this load the machine was unable to get off the water. Ultimately the load was reduced to 750 gallons, and the machine then got off after a run of about three miles.

The flight was financed by Mrs. Frederick Guest, wife of Sq. Ldr. the Hon. F. E. Guest, M.P., who is said to have put up £8,000 for the attempt. The *Friendship* carried a wireless sending and receiving set and sent out messages at intervals.

FRUSTRATED.

On June 12 the Bellanca monoplane *Miss Columbia* (Wright Whirlwind engine), on which Messrs. Chamberlin and Levine flew to Europe last year, left Roosevelt Field, Long Island, New York, on the first stage of a proposed flight to Europe. The pilots were Messrs. Boutillier and Argles, and the passengers were a mechanic and Miss Mabel Boll, notorious for her jewellery, who some time ago figured largely in the Press because of her endeavour to persuade Mr. Levine to carry her as passenger across the Atlantic from East to West.

The machine landed at Harbour Grace, Newfoundland, the same day. The intention was to re-fuel there, to leave the mechanic behind, and for the other three to fly the Atlantic, the particular desire of Miss Boll being to become the first woman to cross the Atlantic by air.

For some reason unexplained the *Miss Columbia* remained at Harbour Grace until the Fokker seaplane *Friendship* had already carried Miss Amelia Earhart to Europe.

TRANS-ATLANTIC BY WAY OF THE AZORES.

At 04.00 hours on June 13 Mr. Frank Courtney and crew left Pisa on a Dornier Wal seaplane and arrived at Lisbon at 17.40 hours. This was the first stage of Mr. Courtney's new attempt to fly to America by way of the Azores.

THE FLIGHT TO INDIA.

The Fokker F.VII (Bristol Jupiter engine), piloted by Mr. C. D. Barnard and Mr. E. H. Alliott, with Her Grace the Duchess of Bedfordshire as passenger, which left Lympne on June 10 in an attempt to fly to India in four stages, arrived at Bushire on June 12, took off again on June 13, but landed again immediately with engine trouble.

An Imperial Airways engineer from Basrah left for Bushire by the weekly mail boat to help in repairing the trouble.

TRANS-PACIFIC A.F.C.'s

His Majesty the King has been graciously pleased to award the Air Force Cross to Mr. Kingsford Smith and to Mr. Ulm who recently flew from San Francisco to Australia.

THE POLAR AIRSHIP VICTIMS.

At the time of going to press the last news received of the Italian Arctic Expedition is that wireless communication has been re-established with General Nobile's party by way of the *Citta di Milano.* General Nobile states that he saw the aeroplanes of Capt. Riiser Larsen and Lieut. Lützow Holm at 80 deg. 33 min. N. and 27 deg. 12 min. E. Unfortunately the aeroplanes did not see him and his party.

Commandante Maddalena arrived at King's Bay, Spitzbergen, at 20.45 hours on June 18 in his Savoia flying-boat and will start a search as soon as possible. Commander Guilbaud of the French Navy has had a Latham 47 flying-boat (two 500 h.p. geared Farman engines) placed at his disposal by the French Government and in it reached Tromsö at 06.00 hours on June 18, leaving again at 16.00 hours for North East Land.

A ROCKET AEROPLANE.

An interesting flight was made at Rositten on June 13 by Herr Stamer, who is experimenting with an aeroplane which the designer intends to be driven on the same principle as the much-talked-of "rocket car" produced by Herr Fritz von Opel. Herr Stamer tested the machine first of all as a glider,—presumably towed behind a car.

While in the air he set off several small rockets so as to try their effect on the glider. So far as it went the test was a success, for the machine landed undamaged, though it appeared to be in danger of catching fire. Consequently Herr von Opel intends to alter the construction of the machine to get away from this danger.

One suggests that if anybody really feels that he has to make a rocket aeroplane, Capt. G. T. R. Hill's Pterodactyl type is ideal for the purpose, as it is the only kind in which rockets can be discharged from the exact centre of resistance of the machine without endangering the controls.

A MEXICAN DOVE OF PEACE.

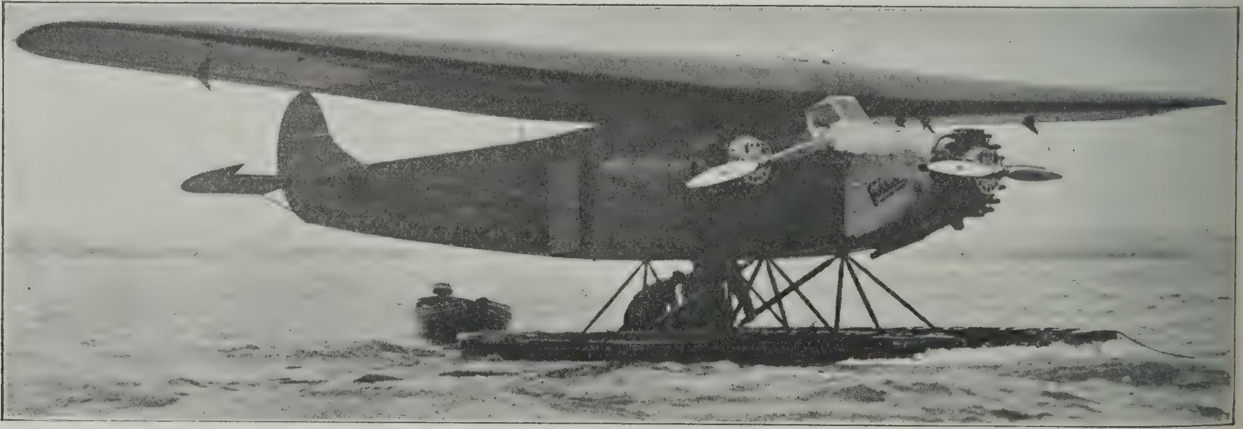
A flight of considerable interest ended on June 12, when Capt. Emilio Carranza, of the Mexican Air Force, arrived in Washington by air from Mexico City, bringing a message of goodwill from the Mexican Government to the Government of the United States. President Coolidge sent President Calles a congratulatory telegram on the success of the flight.

Reports state that Mexico City was elated at the success and that "The church bells, which have not sounded since the beginning of the religious dispute, rang out the glad tidings." Considering that the Mexican Government has been massacreing Roman Catholics in Mexico for the past few years and that there is quite a possibility that Governor Smith of New York may at the next Presidential Election become the first Roman Catholic President of the United States, the appositeness, and at the same time the oddity, of this interchange of messages of good will becomes apparent.

LADY COBHAM'S RECOVERY.

Lady Cobham's illness, which manifested itself during the reception at Rochester, has turned out to be an attack of malaria, evidently acquired while the Calcutta was delayed in Fresco Bay, French Ivory Coast, from April 17 to May 15. The fever was seemingly brought out by the sudden return to the cold and damp of England, although the infection took place some time before.

For two nights Lady Cobham was delirious, but has made an excellent recovery and has been able to attend various functions in connection with the Round-Africa flight. The doctors diagnose the disease as not being of a malignant character, and everyone will wish the plucky lady a complete recovery in the shortest possible time.—C. G. G.



THE TRANS-ATLANTIC SEAPLANE.—The old Fokker monoplane on floats (three Wright Whirlwinds) which flew from Newfoundland to Wales on June 17-18.

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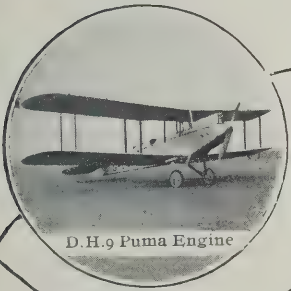
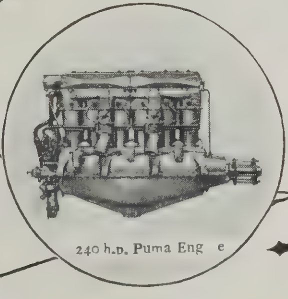
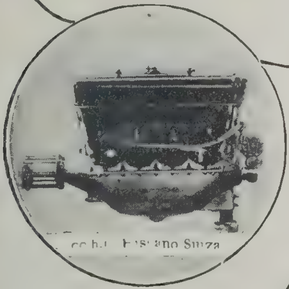


D.H.9 Puma Engine



240 h.p. Puma Engine

Avro type, 504K



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THE ROYAL AIR FORCE.

The London Gazette.

June 12.

General Duties Branch.—The following are granted perm. comns. in the ranks stated (June 1) :—Flt. Lt.—T. B. Bruce, M.C. Flg. Offs.—P. G. Chichester, E. C. Dearth, P. J. A. Hume-Wright, F. R. D. Swain, R. T. Taaffe, M. Wiblin, J. H. Woodin.

The following are granted S.S. comns. as Plt. Offs. on probation with effect from and with seniority of May 25 :—J. C. Allan, C. W. Black, R. A. Bloice, G. R. Chameroy, P. J. Connolly, H. Cook, J. Coverdale, J. Cox, P. J. J. Cullinan, R. F. J. D. Webb, T. W. G. Eady, J. K. Flower, H. C. Friday, B. H. Gahan, J. C. Harcombe, G. A. E. Harkness, C. V. Howes, R. Louis, M. L. McCulloch, A. C. Mitchell, E. C. Passmore, R. C. I. Pearse, P. K. Robertson, J. R. Robins, E. Rotheram, W. Smith, H. V. Thomas, P. C. Wilkin, J. Wilson. R. E. Watts is granted a S.S. comn. as Plt. Off. on probation with effect from May 27, and with seniority of May 25; Plt. Off. on probation A. R. S. Davies is confirmed in rank (April 30).

Flt. Lt. F. H. Williams is placed on the retired list (June 7). The following Flg. Offs. are transferred to the Reserve, Class A, with effect from the dates indicated :—A. G. Moon (June 1); C. E. C. Penny (June 6); E. D. Cummings, D.F.C. (June 7); O. V. Lee (June 12). Flg. Off. W. G. Pudney resigns his S.S. comn. (May 31). The S.S. comns. of the following Plt. Offs. on probation are terminated on cessation of duty :—W. H. B. De Courcy-Wheeler (June 6); J. E. McCann (June 13).

Accountant Branch.—Flt. Lt. (acting Sq. Ldr.) P. J. Farmer relinquishes the acting rank of Sq. Ldr. on ceasing to be employed at Fleet Air Arm Accounts Office, China (May 26).

Medical Branch.—Flt. Lt. J. A. Perdrau, M.D., relinquishes his temp. comn. on completion of service and is permitted to retain his rank (June 1); Temp. Capt. A. H. Mills (Dental Surgeon, General List), is granted a temp. comn. as a Flt. Lt. on attachment to the R.A.F. (June 1); Temp. Lt. H. D. Humphreys (Dental Surgeon, General List) is granted a temp. comn. as a Flg. Off. on attachment to the R.A.F. (June 1).

Reserve of Air Force Officers.—General Duties Branch.—The following Plt. Offs. on probation are confirmed in rank :—Class A.A. (ii).—H. Spooner (May 9); G. A. R. Malcolm (May 25); E. F. Rhodes (June 8); D. F. C. Brecknell (June 8).

Special Reserve.—F. Davison (Aug. 18, 1927); J. Sillery (Feb. 22). The following Flg. Offs. are transferred from Class A to Class C :—L. S. Punnett (May 16); A. H. C. Derby (May 9); W. Dougall (May 11). The following are transferred from Class B to Class C :—Sq. Ldr. E. D. Galloway (April 15); Flt. Lt. F. S. Moore (June 12); Flt. Lt. E. P. Terry (June 12); Flg. Off. E. J. Newman (June 12). Flt. Lt. S. C. Harker is transferred from Class C to Class A (May 23). Flg. Off. A. C. Walker relinquishes his comn. on completion of service, and is permitted to retain his rank (June 8).

The comns. of the following Plt. Offs. on probation are terminated on cessation of luty :—T. G. Jones (May 11); R. Pankhurst (May 17). Flg. Off. J. A. Mollison is removed from the Service (June 5); Plt. Off. A. B. Mitchell relinquishes his comn. in the Special Reserve on account of ill-health and is permitted to retain his rank (June 13).

Auxiliary Air Force.—General Duties Branch.—No. 601 (County of London) (Bombing) Squadron.—Plt. Off. R. I. Forbes-Leith resigns his comn. (June 13). No. 602 (City of Glasgow) (Bombing) Squadron.—The following Plt. Off. (since deceased) to be Flg. Off. :—J. P. Drew (May 19).

Appointments.

Week ending June 18.

Squadron Leaders E. J. P. Burling, D.S.C., D.F.C., to R.A.F. Depot, Uxbridge, 11/6. R. G. Gardner, D.S.C., to H.M.S. *Vindictive*, 11/6.

Flight Lieutenants J. S. T. Fall, D.S.C., A.F.C., to Experimental Section, Royal Aircraft Establishment, South Farnborough, 25/6. J S. L. Adams, to Home Aircraft Depot, Henlow, 21/5. L. G. Maxton, A.F.C., to R.A.F. Base, Calshot, 17/5. G. H. Smith, to No. 25 Sqdn., Hawkinge, 18/5.

Flying Officers (Hon. Flt. Lt.) G. N. Carroll, to R.A.F. Base, Calshot, 1/10. C. V. Lock, to No. 99 Sqdn., Upper Heyford, 18/5. J. J. Nolan, to R.A.F. Depot, Uxbridge, 18/5. N. J. Wiltshire, to R.A.F. Depot, Uxbridge, 18/5. L. H. Ross, to No. 43 Sqdn., Tangmere, 18/5. W. F. Rimmer, to No. 24 Sqdn., Northolt, 18/5. S. H. V. Harris, to R.A.F. Depot, Uxbridge, 25/5. P. B. Chubb, to A. and G. School, Eastchurch, 18/5. H. Waring, to R.A.F. Base, Calshot, 1/10. R. S. Barbour, to R.A.F. Depot, Uxbridge, 17/5. R. Melbourne, to Home Aircraft Depot, Henlow, 17/5. F. J. Parker, to Aircraft Depot, India, 10/5. J. C. Cunningham, to No. 20 Sqdn., India, 10/5. H. W. Taylor, to A. and G. School, Eastchurch, 11/6. J. V. Yonge, to No. 3 Sqdn., Upavon, 11/6.

Pilot Officers—The undermentioned Pilot Officers are posted to No. 4 F.T.S., Egypt, with effect from 8/6 : J. C. Allan, C. W. Black, R. A. Bloice, G. R. Chameroy, P. J. Connolly, H. Cook, J. Coverdale, J. Cox, P. J. J. Cullinan, R. F. J. Doran Webb, T. W. G. Eady, J. K. Flower, H. C. Friday, B. H. Gahan, J. C. Harcombe, G. A. E. Harkness, C. V. Howes, R. Louis, M. L. McCulloch, A. C. Mitchell, E. C. Passmore, R. C. I. Pearse, P. K. Robertson, J. R. Robins, E. Rotheram, W. Smith, H. V. Thomas, R. E. Watts, J. Wilson. H. G. Wheeler, to No. 39 Sqdn., Bircham Newton, 11/6. G. I. L. Saye, to R.A.F. Base, Calshot, 1/1.

Accountant Branch.—Flying Officer J. J. Caiger, to No. 208 Sqdn., Middle East, 31/5.

Medical Branch.—Flying Officers J. H. Cullinan, to A.A.E.E., Martlesham Heath, 2/7. T. A. Edwards, M.B., to No. 3 F.T.S., Grantham, 2/7. A. R. French, to R.A.F. Base, Gosport, 2/7. P. J. Nyhan, M.B., to No. 2 F.T.S., Digby, 2/7. B. A. Porritt, M.B., to No. 5 F.T.S., Sealand, 2/7.

The Chief of the Air Staff.

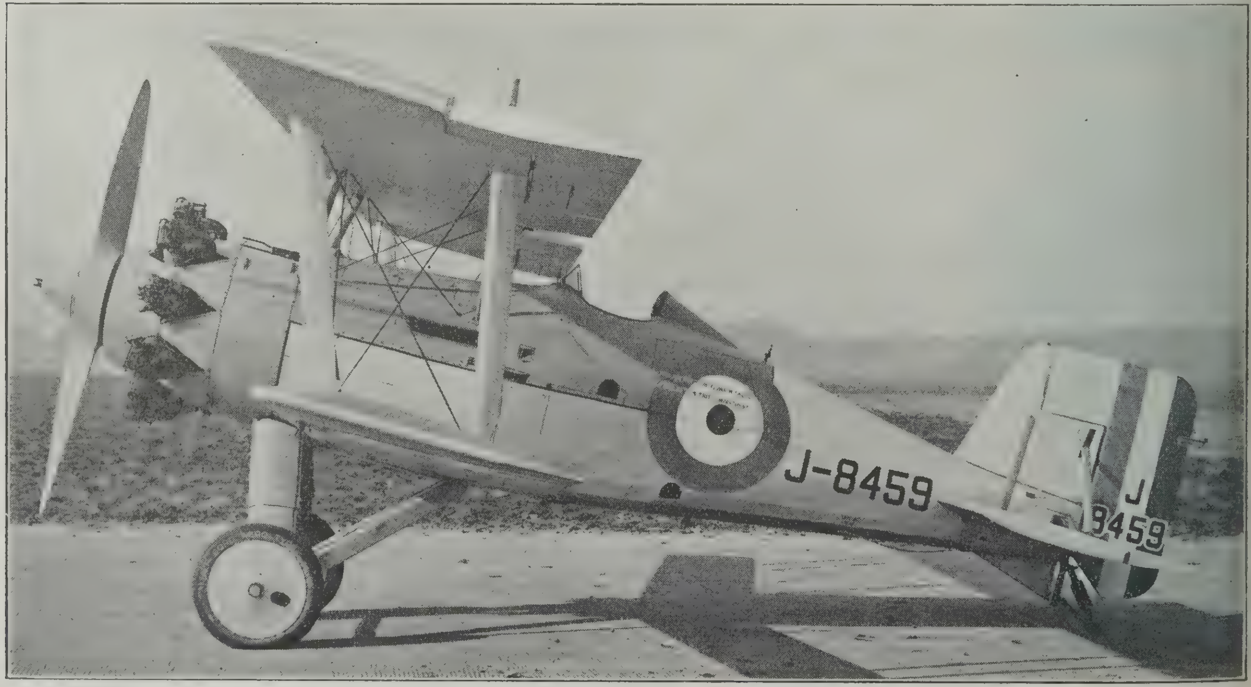
The Secretary of State for Air, in the House of Commons on June 13, in reply to a question by Mr. Albery, said that the appointment of Chief of the Air Staff was not made for a definite period as in the Army and Navy.

A Fatal Accident.

The Air Ministry regrets to announce that as the result of an accident at Shaibah, 'Iraq, to a D.H.9a machine of No. 84 (Bombing) Sqdn., Shaibah, on June 12, 359131 Sjt. Francis George Bamford, the pilot of the aircraft, and 359418 A.C.1. Arthur Sidney Frost were killed.

The Italian Visit.

The Under-Secretary of State for Air, in the House of Commons on June 14, in reply to a question by Sir Harry Brittain, said that the Italian authorities were contemplating sending a number of Italian aircraft to visit London this month. Stress had been laid by the Italian authorities on the informal character of the visit and it had been suggested that official recognition should be limited to the accommodation of the aircraft and mechanics at a Royal Air Force aerodrome, where all possible facilities would be given them. The Government hoped that General Balbo, the Italian Under-Secretary of State for Air, who was himself taking part in the flight, would, with his personal staff, consent to be their guests.



A FIGHTER.—The Boulton and Paul Partridge (Bristol Jupiter engine), one of the Experimental Fighter machines which will be seen at the R.A.F. Display on June 30.

FOR THE SURVEY OF RIO DE JANEIRO

Photo by Short Bros.
All-Metal Floats.

"...by far the biggest and most important contract yet let to a British concern..."

says "THE TIMES" in their article concerning the contract of a detailed survey of the city of Rio de Janeiro secured by the Aircraft Operating Company.

and MOTH HAS BEEN CHOSEN

A MOTH seaplane of the latest type fitted with Handley Page slots and carrying an Eagle automatic electric camera is part of the equipment which the Aircraft Operating Company is taking to Rio de Janeiro with which to survey that city. This, therefore, is another instance where, with the whole world of light aircraft to pick from, preference was bestowed upon the Moth as the light seaplane of greater performance, and greater reliability — proved beyond doubt by years of satisfactory service in all quarters of the globe. Both Moth land and seaplanes are constantly being chosen by Governments, Flying Clubs, Aerial Transport Bodies and Private Owners alike for adaptation as standard equipment and for special aerial commissions . . . evidence beyond dispute that Moth is the world's best light aircraft. . . . . .

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The R.A.F. Display.

The Ninth R.A.F. Display will be held at Hendon on June 30. The gates will open at 10.00 hours, and flying will begin at 11.00 hours. The programme proper does not begin until 15.00 hours, but, as usual, there will be a number of interesting events during the morning.

The set-piece this year will be an attack by bombers on an oil refinery. The attack will be duly repulsed by Fighters and Kite-Balloons. A/A. guns and a flight of Ship's Fighters will take part in the scheme.

Another important item will be an air battle for London, which will end with machines from both sides being "shot down in flames."

Exhibitions of individual aerobatics will be given during the morning and again in the afternoon.

The lesser events will include the popular race for officers of the Reserve of Air Force officers, and a Headquarters Race for *personnel* of the various Air Headquarters, an exhibition of slow-flying, an air combat between two Fighters, an altitude race, and a Demonstration shoot. The Air Ministry Departmental Race and the message competition for Army Co-operation Squadrons have been discontinued this year.

The mass-formation flying, known as Wing evolutions, will be done by day-bombers, night-bombers and fighters.

In the day bombers' event the three Squadrons taking part will be equipped with Hawker Horsleys, Fairey Foxes and Fairey III.Fs. The timing of the day-bombers' evolutions this year has been so arranged that the formations will not be out of sight of the aerodrome and will cross the aerodrome at one minute intervals in their various formations. The formation known as Squadron in line abreast, when all the machines are in a straight line wing-tip to wing-tip, has been washed out, as it is thought to serve no useful purpose in time of war, and is therefore no longer used in training.

The evolutions by a Wing of Fighter Squadrons will be controlled by the Wing Commander, who will be in the air, but not part of a formation. The three Squadrons will evolute independently, but finish in Wing formation. Their operations will include the Prince of Wales' Feathers, loops and half-rolls-on-top-of-a-loop in formation; figures-of-eight by Squadrons and then by the whole wing, the continuous circle known as the Mulberry Bush, and a new stunt whereby one machine will dive through a hoop made by the rest of the Squadron.

The night-bombers will cruise about in formation, and the critical should remember that it is more difficult to keep formation in these big machines because they have so little range of speed.

With regard to the ground organisation there is a large extra space this year for car-parking owing to the demolition of some old sheds which used to stand alongside the County of London Squadron sheds. This space will be particularly useful to those who want to sit in the boxes or grand-stands and do not want to watch the show from their cars.

The boxes have all been sold, but there are still some seats in the stands for which a charge is being made this year. Reserved seats on the stand in the 10s. enclosure are 3s. each, and on the stand in the 5s. enclosure are 2s. 6d. each. Application for these seats should be made to the Secretary, R.A.F. Display, Hillingdon House, Uxbridge. There are not likely to be any left on the day of the Display. There will, as usual, be plenty of seats in the enclosures themselves.

Squadron Leader Probyn.

Sq. Ldr. H. M. Probyn, D.S.O., whose appointment to command No. 2 (Army Co-operation) Squadron is dated Mar. 17, was born in 1891 at Brindle, Chorley, Lancashire, and educated at the Blue Coat School at Bridgnorth. He joined the Royal Engineers in October, 1914, and was granted a commission in the 5th Batt. the Royal Warwickshire Regt. in April, 1915. He was seconded to the R.F.C. in May, 1916, with the rank of Flying Officer and promoted to be Captain in April, 1918. He served in France from July, 1916, until September, 1917, and was appointed to be a Companion of the Distinguished Service Order for gallantry and devotion to duty. He was mentioned in dispatches on Dec. 11, 1917 (France), and Jan. 1, 1919 (Coastal Patrol). After the Armistice he was posted to No. 208 (Army Co-operation) Squadron, Ismailia, Egypt, where he was stationed until February, 1926, when he was posted to the School of Army Co-operation, Old Sarum. He was promoted Squadron Leader in January, 1923.

A Kinkead Memorial.

A number of friends of the late Flt. Lt. S. M. Kinkead, D.S.O., D.S.C., D.F.C., are anxious to establish a memorial to him because of his service record in war and peace, and because of his unfailing modesty and sincerity. They consider that this can best be done by presenting a portrait of him to the Royal Air Force Club, and so they have asked the Committee of the Club whether such a memorial would be acceptable.

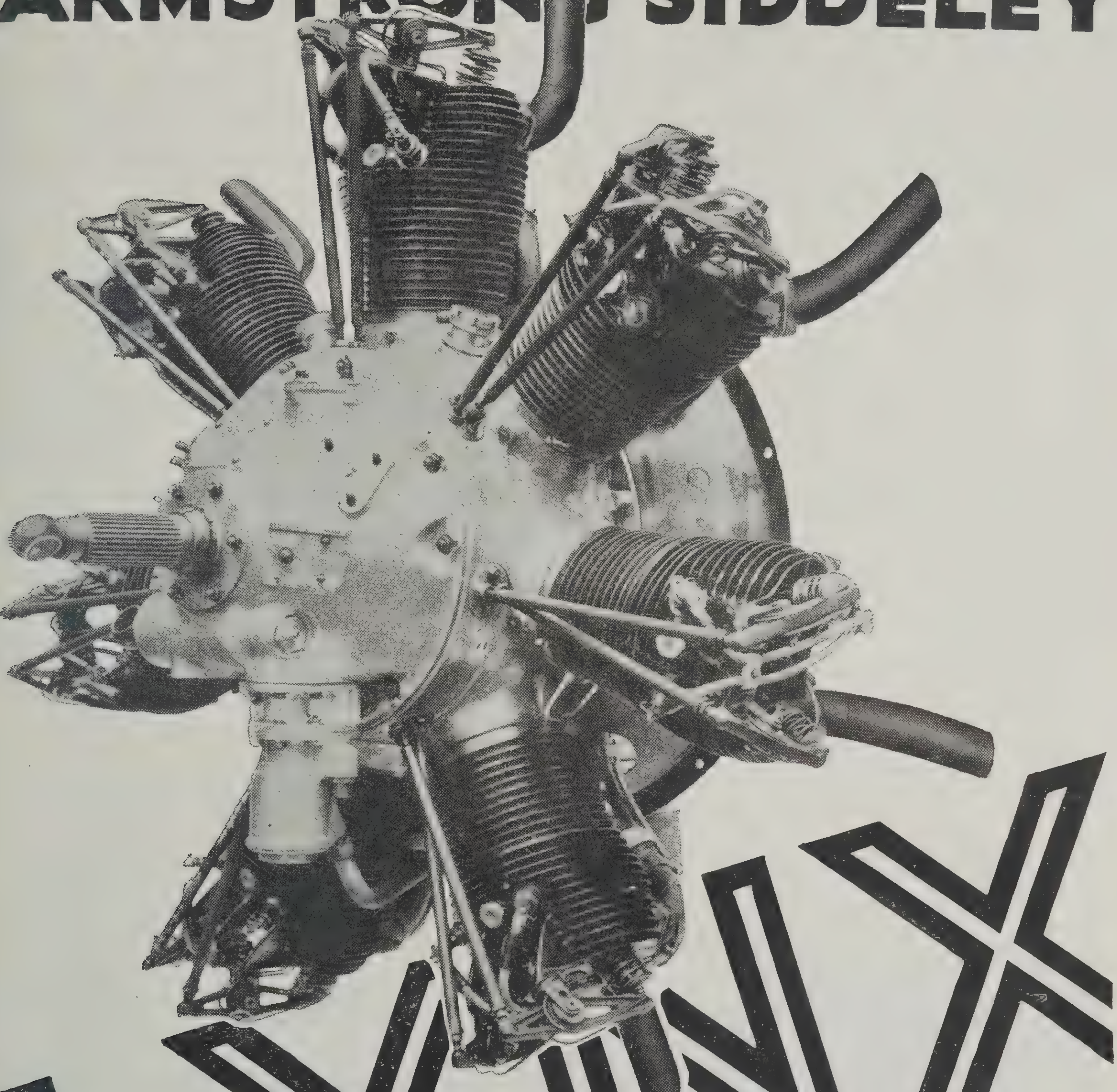
Contributions towards the proposed memorial should be sent to Flt. Lt. J. I. T. Jones, R.A.F., Hendon. Cheques should be made out to "Kinkead—Jones."

Any surplus money will be handed over to the Kinkead Grave Memorial Committee, which has undertaken the care of his grave, as his relatives live in South Africa.

REHEARSING.—Fairey III.Fs (Napier Lion engines) of No. 207 (Bombing) Squadron, R.A.F., taking-off for a rehearsal of the Wing Evolutions by day-bomber Squadrons for the R.A.F. Display on June 30.

("Aeroplane" photograph.)

ARMSTRONG SIDDELEY



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R.A.F. SPORTS AND PASTIMES.

Cricket.

The R.A.F. beat the Army at the Oval on June 13, 14 and 15 by 10 wickets. The R.A.F. won the toss and made 303 in their first innings. Of these Flg. Off. M. S. Shapcott, of Halton, made 68; Flt. Lt. Fawcus, also of Halton, made 74, and Flg. Off. Beisiegle made 54. The Army then went in and made 29.

On the second day the Army completed their first innings with a total of 105 and had followed on with 18 for no wickets when a heavy downpour of rain stopped play for the day.

On the third day the Army finished with a total of 205 and the R.A.F. went in again and made 10.

The details of the scoring were as follows :—

R.A.F. (First Innings).—Flg. Off. E. G. Northway, run out, 28; Flg. Off. M. S. Shapcott, c. Wilkinson, b. Hill, 68; Wing Cdr. C. H. B. Blount, c. Stanyforth, b. Gore, 10; Flg. Off. W. K. Beisiegle, b. Hill, 54; Flt. Lt. E. A. Fawcus, b. Miles, 74; Sq. Ldr. B. E. Baker, c. Williams, b. Hill, 0; Flt. Lt. R. E. G. Fulljames, b. L-Barclay, 16; Flg. Off. V. Croome, b. L-Barclay, 0; Flg. Off. R. P. H. Utley, b. Miles, 30; Sq. Ldr. C. B. Cooke, b. Miles, 0; Sq. Ldr. L. H. Slater, not out, 1; Byes, 8; l.-b., 14, 22; Total, 303.

Second Innings.—Flg. Off. E. G. Northway, not out, 2; Flg. Off. M. S. Shapcott, not out, 5; Byes, 3; Total (no wkt.), 10.

Army.—Capt. A. C. Wilkinson, run out, 21, c. Beisiegle, b. Fulljames, 15; Capt. E. S. B. Williams, c. Blount, b. Fulljames, 37; c. Utley, b. Fulljames, 58; Lt. T. Bevan, c. Shapcott, b. Utley, 6, c. Fulljames, b. Blount, 1; Lt. R. E. H. Hudson, st. Croome, b. Fulljames, 4, b. Cooke, 37; Maj. F. R. R. Brooke, c. Slatter, b. Fulljames, 17, c. Croome, b. Fulljames, 4; Capt. R. T. Stanyforth, c. Slatter, b. Fulljames, 0, l.-b.-w., b. Utley, 15; Lt. H. R. Kirkwood, c. Baker, b. Fulljames, 0, c. Beisiegle, b. Fulljames, 23; Lt. H. P. Miles, c. Shapcott, b. Utley, 3, c. Fawcus, b. Utley, 4; Lt. A. C. Gore, c. Blount, b. Fulljames, 11, b. Fulljames, 20; Capt. H. S. Lewis-Barclay, c. Croome, b. Fulljames, 2, not out, 12; Lt. D. V. Hill, not out, 0, c. Fulljames, b. Blount, 3; Leg-byes, 4; Byes, 6; l.-b., 6; n.-b., 1, 13; Total, 105, Total, 205.

The R.A.F. Lawn Tennis Association.

The Airmen's Lawn Tennis Championship will be held at Halton from June 25 to June 29 inclusive. A Cup has been presented by the Secretary of State for Air for competition in the Singles. A replica of the Cup will be given to the winner and a prize to the runner-up. The Doubles Championships will be played as last year. Entries for the Singles must reach Flt. Lt. E. H. D. Davies, R.A.F. Halton, by the first post on June 19. Entries for the Doubles will be made during the Tournament Competitors will be attached to the Administrative Section during their stay at Halton.

The R.A.F. Lawn Tennis Championships, Singles, Doubles, Inter-Station Doubles, R.A.F. Plate and Veterans' Cup, will be held at Queen's Club, West Kensington, from July 9 to July 14 inclusive.

The R.A.F. plate is for all competitors knocked out in the first and second rounds of the Singles. The Veterans' Cup is for serving or retired officers over 40 years of age.

Entry forms received later than first delivery on July 2 will not be accepted.

The Inter-Services' Lawn Tennis Championship will take place at Wimbledon on July 11 and 12.

The Harlescott Sports.

The R.A.F., M.T., Depot, Harlescott, Annual Athletic Sports were held on June 14. The winners were as follows :—

100 *Yards.*—Cpl. Rosam (11 sec.). *Hurdles Relay.*—No. 5 Section. *Mile Relay.*—No. 5 Section. 440 *Yards.*—Sjt. Ellis (56 3-5 sec.). 440 *Yards Relay.*—No. 1 Section. 220 *Yards.*—Cpl. Rosam.

W.O.s' and Serjeants' Race.—Sjt. Goacher. *Corporals' Race.*—Cpl. Smith (535). *Two Miles' Relay.*—No. 5 Section (9 min. 41 sec.). *Officers' Race.*—Flg. Off. Perry-Keene (scr.). *Cycle Relay Race (four miles).*—No. 4 Section.

Tug-of-War.—Winner, No. 3 Section; runners-up, No. 7 Section. *Mile Team Race.*—No. 4 Section.

The following events had been decided previously :—

Marathon (12 *miles*).—1, AC. Plank; 2, AC. Ellis; 3, AC. White; time, 1 hr. 7 min. 15 sec. *Cross-country Run.*—1, Sjt. Ellis; 2, AC. Plank; 3, AC. White.

High Jump (teams of two).—No. 5 Section (winners' heights, 5 ft. 2 in. and 4 ft. 11 in.; total, 10 ft. 1 in.). *Long Jump (teams of two).*—No. 5 Section (winners' lengths, 18 ft. 11 in. and 17 ft. 9 in.; total, 36 ft. 8½ in.). *Putting-the-Shot (teams of two).*—No. 5 Section (winners' lengths, 34 ft. 0¼ in. and 30 ft. 10½ in.; total, 64 ft. 10¾ in.). *Throwing the Cricket Ball.*—AC. Rainbow.

The scores obtained in athletic events by the various Sections were: No. 5 (winners), 67; No. 4, 42; No. 1, 38; No. 3, 34; No. 2, 24; No. 7, 13; No. 6, 1.

Shotting.—The following were the results of the shooting, previously decided on the Wrekin Ranges :—Wilson Challenge Cup, won by the donor, Flt. Lt. G. E. Wilson; winner of 1st stage, AC.1. Butcher; winner of 2nd stage, Flt. Lt. Wilson; winner of 3rd stage, L-AC. Grant.

Depot Bisley Team.—Flt. Lt, Wilson, L-AC. Walters, L-AC. Grant, L-AC. White, F-S. Browning, AC.1. Butcher, Sjt. Moyles, AC.1. Swift, and S-M.2. Grierson.

At the conclusion of the Sports the prizes and the Inter-Section Cups were presented by Mrs. Mounsey.

DESERT WARFARE.—Photographs taken during R.A.F. operations in 'Iraq. At the top on the left are two D.H.9as in the desert near Jumaima, on the Nejd-'Iraq frontier—after rain—and on the right, the R.A.F. changing engines in the "blue." The lower picture on the left shows a group of Arabs of the Al Zayyad (shepherd) tribe; and on the right an officer of the R.A.F. interrogating 'Iraq desert tribesmen concerning the whereabouts of some of the raiders.

CASTLE BROMWICH
AIR PAGEANT
JUNE 9th

**Air League
Challenge Cup**

1st Sqdn. Leader Probyn **2nd** Norman Jones, Esq.
SECOND SUCCESSIVE WIN 1927-1928

**Midland Inter-Club
Handicap**

1st Newcastle Club **2nd** Norman Jones, Esq.

**Midland Open
Challenge Cup**

2nd Nottingham Club **3rd** Sqdn. Leader Probyn

*Six more
successes
on*

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At last!

**A
Woman
flies the
Atlantic**

The Spirit used
by Miss Earhart
in her Seaplane
"Friendship"
was from the
producers of

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WHAT CANADA IS DOING.

A company known as the Northern Aerial Minerals Exploration Ltd. has been formed with headquarters in Toronto and a flying base at Winnipeg for the purpose of carrying on mineral exploration throughout Northern Canada.

The company will establish four bases, one of which will be at Gold Pines, Ont., and one at The Pas, Man. Ten groups of prospectors, each consisting of two or three men, will operate from each base on a radius of 500 miles.

The president of the new company is Mr. Jack Hammell, a well-known figure in the Red Lake mining area, and Capt. H. A. Oake, formerly of Western Canada Airways, is director of aerial operations.

The company has bought twelve aircraft, consisting of six Fairchild cabin monoplanes, two with the 200 h.p. Wright Whirlwind engine, and four with the 425 h.p. Pratt and Whitney Wasp engine, and six Fokker Universal monoplanes, all fitted with the Pratt and Whitney Wasp engine. All will have interchangeable floats and skis.

Western Canada Airways, of Winnipeg, Man., the biggest commercial aircraft operator in Canada, has bought Pacific Airways Ltd., of Vancouver, B.C.

The new combination, in addition to its big programme of operations in Northern Ontario and Manitoba, will now conduct the fisheries patrol for the British Columbia Government and plans to operate a triangular passenger and express service between Vancouver, Victoria and Seattle with one round trip daily.

A number of new aircraft will be sent out to Vancouver, including two of the nine Fokker Super-Universals (425 h.p. Pratt and Whitney Wasp engines) at present on order for the company for work in Manitoba. These two machines will be used on the projected passenger air service mentioned above.

The company has also bought a Loening cabin amphibian (425 h.p. Pratt and Whitney Wasp engine) and two Boeing Flamingo flying-boats (Wright Whirlwind engines). The Boeing boats will be operated from a seaplane station now under construction on English Bay, Vancouver.

The town of Cap de la Madelaine and Three Rivers, Que., have built a joint airport on the east side of the St. Maurice River. The Canadian Fairchild Company is reported to be considering taking over the airport on a five year lease to develop and operate it as a commercial aerodrome.

The new airport at St. Hubert, Montreal, is now ready for use. Three hangars have been built and the aerodrome rolled and is in excellent condition for flying. The clubhouse of the Montreal Flying Club is rapidly approaching completion.

A special committee of the Toronto Board of Controllers has recommended to the Board that Toronto establishes a municipal airport. At present the city has had the use of the private aerodrome of the Toronto Flying Club.

The Canadian Fairchild Company has established a fire patrol base at Blue Sea Lake, near Ottawa, for the Canadian International Paper Company.

During the navigation season of the St. Lawrence River four single air mail trips will be made weekly between Rimouski and Montreal by the Canadian Transcontinental Airways Ltd. at a contract air mail rate of $1.25 per flying mile.

The distance is 330 miles and the annual subsidy paid to the company will be $49,500.

The same company operates a Montreal—Ottawa mail service twice weekly for an annual subsidy of $8,250.

Canadian Airways operates a Montreal—Toronto service for an annual subsidy of $49,500.

All these three contracts have been let by the Post Office Department for four seasons.

On May 28 the Winnipeg Flying Club opened its new aerodrome with a flying meeting.

The Canadian Wright Company of Montreal, a subsidiary of the Wright Aeronautical Corporation, of Patterson, N.J., has completed the assembly of the first Whirlwind engine in Canada. This company holds the manufacturing rights of the Whirlwind engine for the whole of the British Empire.

The Board of Trade of Lunenberg, Nova Scotia, is promoting the construction of an airport and is prepared to organise an air line to Boston and New York during the summer months.

The Engineers' Service Flying School, of Montreal, has bought a three-seat Swallow biplane (90 h.p. Curtiss OX-5 engine).

THE D.H. MOTH IN THE U.S.A.

The Moth Aircraft Corporation has been incorporated in the State of Delaware with a capital of $500,000 (£100,000) to manufacture under licence the D.H. Moth fitted with Handley Page automatic slots and the D.H. Gipsy engine.

The principal officials of the company are Earl L. House, business manager, formerly in charge of the Army Air Service Photographic Section; J. Edwin Morrow, factory manager in charge of production, formerly vice-President of the Willys-Morrow Company, builders of more than 7,000 Curtiss OX-5 engines during the War and later factory manager of the Atlantic Aircraft Corpn.; and Kenneth R. Unger (late R.A.F.), formerly a U.S. air mail pilot.

A factory is being built and 250-300 men will be employed at the outset. The first Moth is due for completion by the last week in August and it will be entered in the National Air Races to be held at Los Angeles in September. The company will attempt to reach a production of six machines per week by the end of the year.

The Moth to be built will incorporate a split-axle undercarriage with wide wheel-tread, steerable tail-skid and adjustable tail-plane.

The D.H. Gipsy engine will be imported at first until there has been time for complete equipment of the engine shops.

Air Associates Inc., of 535, 5th Avenue, New York City, and Curtiss Field, Long Island, N.Y., recently purchased a slotted Moth (A.D.C. Cirrus engine). Almost as soon as this machine was assembled and flown at Curtiss Field it was bought by Mr. Grover Loening, President of the Loening Aeronautical Engineering Corpn., for his private use. As the result of its demonstration several more orders have been placed with the De Havilland Company for early delivery.

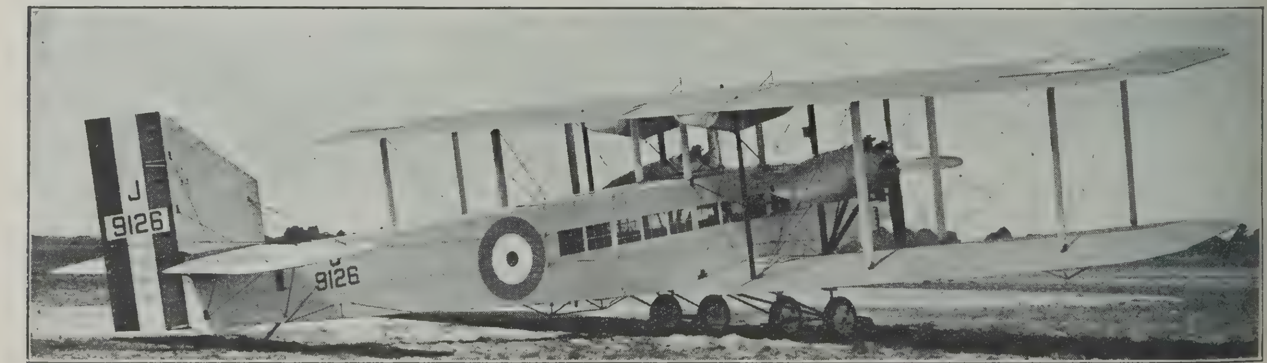
Air Associates Inc. has no sales agreement with the De Havilland Company, but it intends to sell as many Moths as it can.

TRAIN VERSUS AEROPLANE.

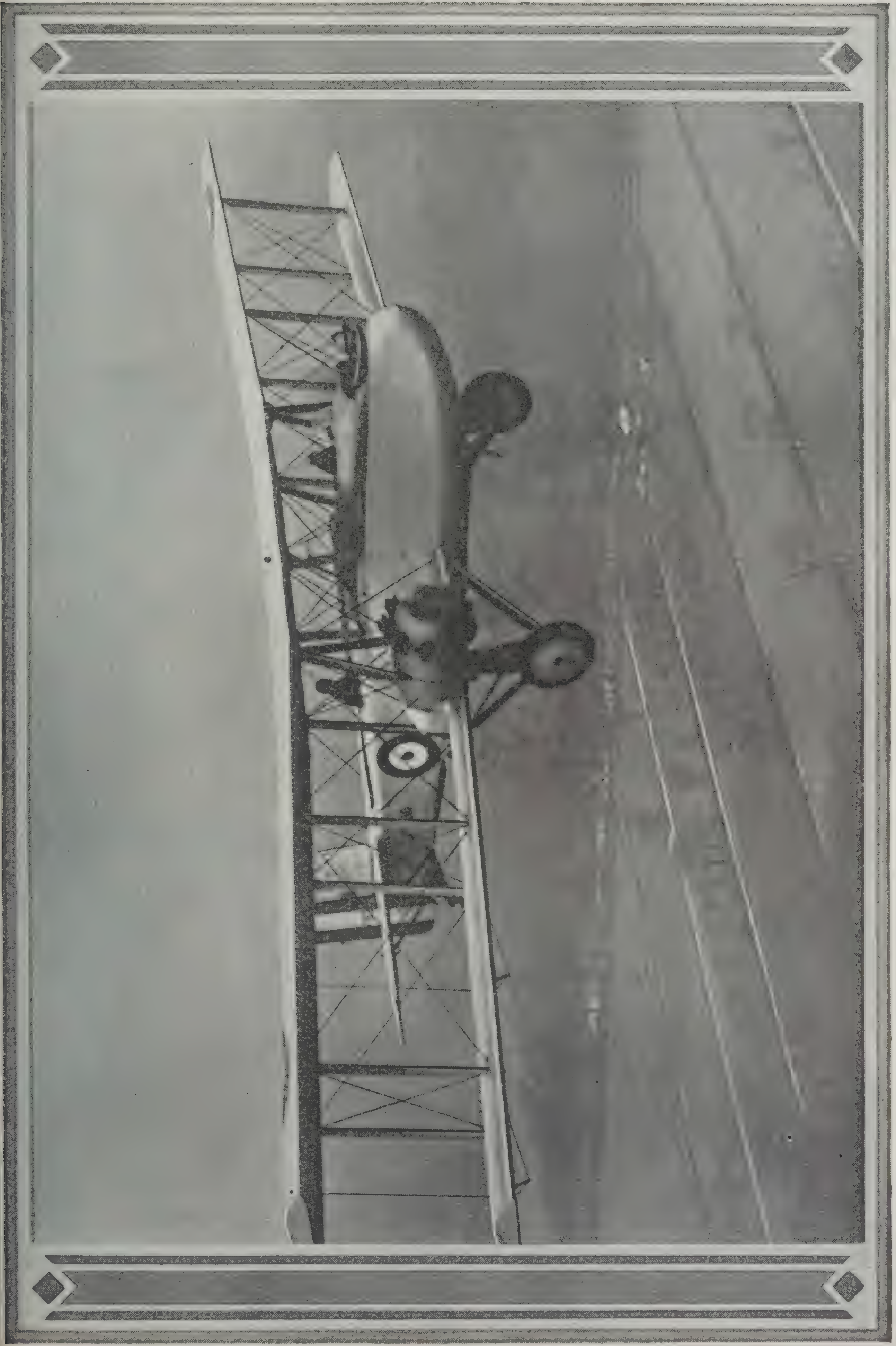
Though it was only an advertisement, or propagandist, stunt, the rival journey between the Imperial Airways' Armstrong-Whitworth Argosy G-EBLF and the "Flying Scotsman," from London to Edinburgh on June 16, was really a matter of some importance because it did undoubtedly give the great British Public some idea of the difference in rate of travel between even a comparatively slow aeroplane and the fastest of railway trains.

The aeroplane left Croydon at practically the same time as the train left King's Cross. The aeroplane covered an extra 76 miles over the East Coast and landed twice to refuel, first at Bircham Newton and secondly at Cramlington, Newcastle. The stops, apart from the extra distance covered, amounted to 84 minutes. The train got to Edinburgh 10 minutes ahead of schedule time and the aeroplane arrived almost simultaneously.

The train is timed to take 9 hours 15 minutes over the journey, and the aeroplane was actually in the air 6 hours and 15 minutes, in spite of its extra 76 miles and a strong head-wind all the way.



CAPACITY.—The Handley Page Clive (two Bristol Jupiters), a troop-carrier.



BOULTON & PAUL ALL-METAL "SIDESTRAND" DAY BOMBER.

(*Photograph by "Aeroplane."*)

The pilot of the machine was Mr. G. P. Olley, and in it were Air Vice-Marshal Sir Vyell Vyvyan, one of the directors of Imperial Airways Ltd., and Major H. G. Brackley, Air Superintendent of the line. The aeroplane carried 18 passengers, among whom was Mr. Birkett, aged 79, a retired engine-driver of the L.N.E.R. A member of the staff of Imperial Airways travelled on the footplate of the locomotive, thus securing an interchange of impressions.

Another interesting point was that both the train and the aircraft carried wireless sets and were in touch with one another by wireless telephone throughout the journey.

ANOTHER BRITISH SCORE.

A contract for six large flying-boats of the well-known Southampton type for the Argentine Navy has been placed with The Supermarine Aviation Works Ltd., of Southampton. Together with the order for spares this is one of the most important foreign contracts ever secured by Great Britain for sea-going aircraft.

Five of the Southamptons for the Argentine Government will be similar to those recently supplied by the firm to the Australian Government and will be fitted with wooden hulls. The sixth machine will be of metal construction and of a type similar to the four used by the Royal Air Force Far East Flight.

A contract has also been placed for a metal Southampton for early delivery to the Imperial Japanese Navy, and it is understood that if the trials of this machine in Japan are satisfactory further orders will be placed.

Undoubtedly the placing of these contracts with the Supermarine Company has been greatly influeneed by the successes of the firm in the Schneider Trophy Contest at Venice last year, together with that of the Far East Flight which has reached Australia. This proves the importance of Air Ministry enterprises of this nature and the assistance which they can give to British firms in securing foreign contracts.

Squadron-Commander James Bird, Chairman and Managing Director of the Supermarine Aviation Works, is to be congratulated on the success he has achieved in securing these contracts in face of strong competition from Italian, French and German companies who can produce cheaper than the British Aircraft Firms, a fact which alone goes to prove that flying-boats of British design and build are superior to similar types built abroad.

THE SIDDELEY TROPHY.

The Challenge Cup, together with £250 in prize money, which has been presented by Mr. J. D. Siddeley, C.B.E., for a competition for amateur pilots of light aeroplanes, is a prize which should appeal to all non-professional pilots. The only restriction on entrants is that they shall be amateurs and that the machines, which must be either the property of a club or of a private owner, shall weigh not more than 1,000 lbs. empty.

The entrance fee is £5 and half of this will be returned to all starters.

The event will be a handicap race over a course of approximately 1,050 miles, starting from Hendon Aerodrome on Friday, July 20, and ending at Brooklands on Saturday, July 21. The course for the first day involves stops of 20 minutes each at Mousehold Aerodrome (Norwich), Castle Bromwich (Birmingham), Hucknall (Nottingham), Sherburn-in-Elmet (Yorkshire), and ending at Renfrew Aerodrome, near Glasgow. On the next day the course was from Glasgow to Hooton Park (Liverpool), Filton (Bristol), Hamble, and Lympne—again with a 20-minutes' stop at each—to Brooklands. Between Glasgow and Liverpool competitors have to pass round the tower at Blackpool.

Handicaps will be based on the known performance of the entered machines. The starts from Hendon will be arranged in accordance with the proportionate handicap for the first day's stage. The start from Glasgow will be in accordance with the proportionate handicap for the second stage, plus or minus time gained or lost on the first day.

It should be noted that this race takes place concurrently with the race for the King's Cup, over the same course, and competitors for the Siddeley Challenge Trophy may be also competitors for the King's Cup.

OLIVER VICKERS.

With deep regret THE AEROPLANE has to announce the death of Oliver Henry Douglas Vickers, eldest son of Mr. Douglas Vickers, Chairman of Vickers Ltd. Oliver Vickers had been in poor health for some time, but not definitely ill. On June 15 he was seized with pneumonia while at Weybridge. He was taken to hospital, and died early in the morning of June 17.

Oliver Vickers was a special Director of Vickers Ltd., his particular duties being in relation to the Aircraft Department of the firm.

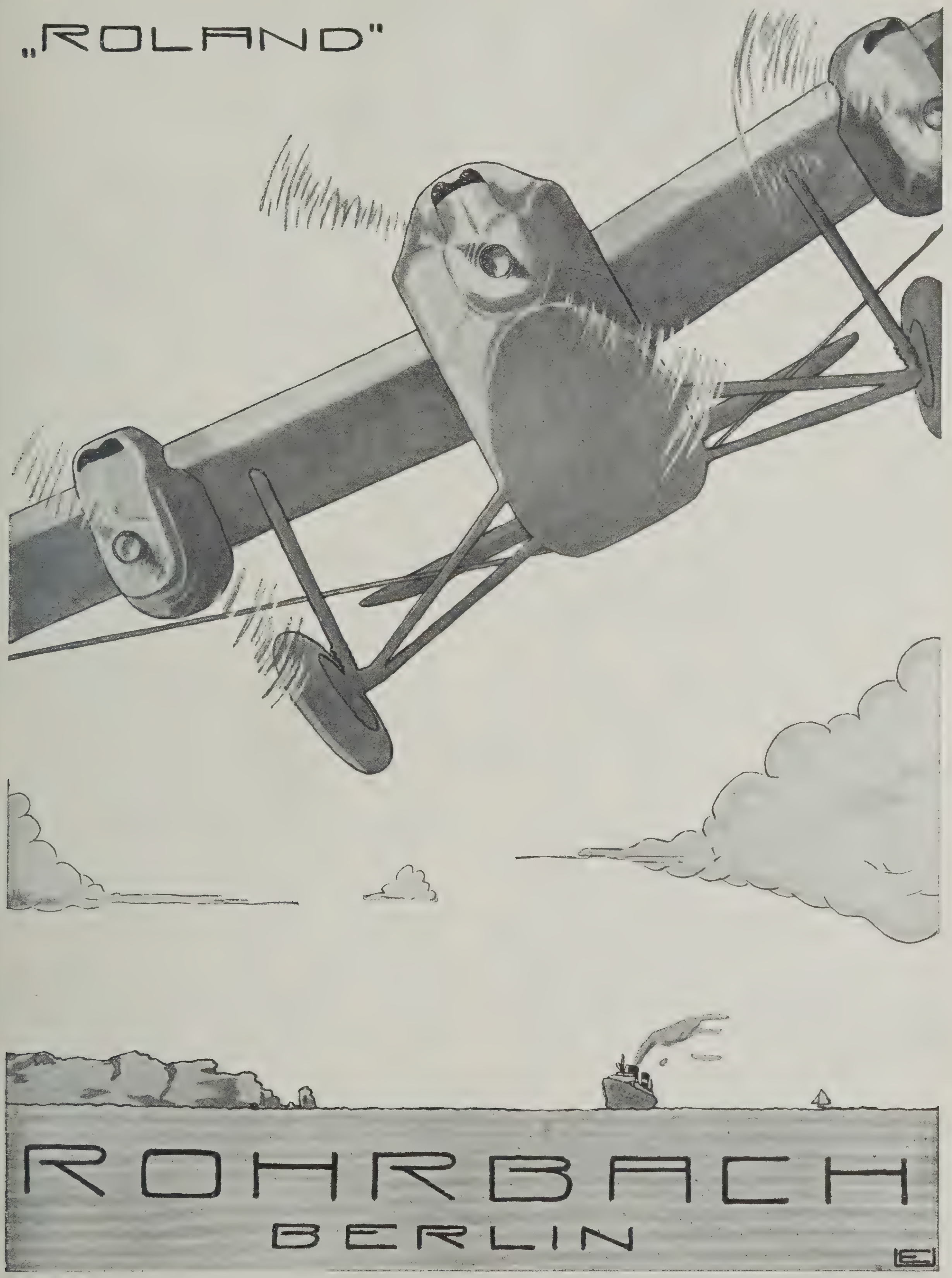
In this capacity he acted as technical adviser to the Works at Weybridge and also acted in liaison with the Air Ministry and the Royal Air Force. His knowledge of aircraft of all types, and his unusual gifts as a mechanical engineer, made his work of high value not only to his firm but to the Air Force.

He was born on Sept. 13, 1898. He joined the R.F.C. as temporary 2nd Lieutenant in March, 1917, and became a Flying Officer, R.A.F., on May 29, 1918. He was promoted temporary Captain in July, 1918, and was transferred to the Unemployed List in January, 1919.

During his term of service in the R.A.F. he was Assistant Instructor to No. 90 Squadron and No. 51 Training Depot Station.

To Mr. Douglas Vickers and his family one offers sincere sympathy in their loss.—C. G. G.

INTERNATIONAL AIR TRANSPORT.—A Fokker monoplane, with Armstrong Siddeley Lynx engines, used on the Munich—Milan Air Line. Left to right : Mr. Sekatz (Fokker) pilot, Cavallarin, Grase (Fokker) pilot, On. Gianferrari (President A.L.I.), On. Merzagora (A.L.I.), pilot-eng. Tarantini (Director A.L.I.), pilot Riva (A.L.I.). The staff of the new Munich—Milan Air Line.



IF . . . .

If one engine fails, what———?
Most aeroplanes equipped with two engines, or three, would be compelled to make a forced landing in this case.
Forced landing, that means: late arrival, perhaps danger to passengers, pilot and craft.

There is only one three-engined all-metal aeroplane in the world which maintains straight level flight (under full load) with only two engines running:

THE "ROHRBACH ROLAND."

KINDLY MENTION "THE AEROPLANE" WHEN CORRESPONDING WITH ADVERTISERS.

BOOKS TO READ.

Enemy Airships.

The Zeppelins, Captain Ernst A. Lehmann and Howard Mingos. 6 x 9¼. XII. 329 pp. 42 illustrations. G. P. Putnam and Sons. From The Aeroplane Book Department, 18s. net.

Although a number of interesting and a few good books have been published dealing with the activities of the heavier-than-air side of the Flying Services during the War of 1914-1918, there is a dearth of similar books on the subject of airships. Therefore, the present volume is to be welcomed on this account alone, apart from its merits. Captain Ernst Lehmann is qualified to write on the subject of Zeppelin airships, inasmuch as he was a pilot of such craft before and during the War, and the fact that he is a director of *Luftschiffbau Zeppelin G.m.b.h.* enhances the value of his book.

In the main, the volume deals with the author's experiences, but, in addition, gives a general account of the development of the Zeppelin airship, from *L.Z. I.* to *Z.R. III.*, better known as the *Los Angeles.*

The first few chapters are devoted to the story of the activities of Zeppelin airships during the siege of Antwerp and on the Russian frontier—operations which had to be abandoned on account of heavy losses. Subsequent pages deal in a scrupulously fair manner with the policy dictating the making of raids on this country; the expansion of the Imperial German Naval Airship Service; the technical advances made with the airships themselves, enforced by the improvements in our defences; the endurance flight of 101 hours over the Baltic, made by *L.Z.* 120. (Lehmann was her captain); the great voyage of *L.* 59 from Jamboli to the neighbourhood of Khartum and back in Nivember, 1917, (a distance of 4,230 miles), in an attempt to drop stores on the beleaguered troops of General von Lettow-Vorbeck in East Africa—and many other interesting events.

A considerable amount of information is given about the raids over this country, although, of course, such matter, though quite unbiassed, is a little one-sided, as the author had not access to the reports of the defenders.

The chapters dealing with the activities of Zeppelin airships over the North Sea are particularly valuable—few people in this country realise what a potent influence these airships had on the course of the naval war, and what it cost us before we were able to master them. The author quotes what he states "is part of a secret British report dated September 20, 1917," which purports to give the views of the Admiralty on the Battle of Jutland :—

> It is no small achievement for their Zeppelins to have saved the High-Seas Fleet at the Battle of Jutland; to have saved their cruiser squadron on the Yarmouth raid, and to have been instrumental in sinking the *Nottingham* and *Falmouth*. Had the positions been reversed in the Jutland battle, and had we rigids to enable us to locate and annihilate the German High-Seas Fleet, can anyone deny the far-reaching effects it would have had in ending the war?

This report may or may not be genuine, but to those who have any knowledge of the subject, it cannot be said that the extract errs much on the side of exaggeration.

"The Zeppelins" was published originally in the United States of America, and bears traces of having been written for this audience (one could have wished that the publishers of the English edition had exorcised that terrible word "airplane"), but in general it is well written, although it lacks cohesion in parts, and the omission of an index is a serious fault in a book of this character.

Apart from these defects (and what book has no defects?) it is a good book, and one that should be read by all those in the Royal Air Force who desire to widen their knowledge of the recent war and to appreciate what certain very able and very brave men did then in the interests of an opposing Service.—C. F. S. G.

The Great Confusion.

Airmen or Noahs, Rear-Admiral Murray F. Sueter, C.B., R.N., M.P. 448 pages, four coloured plates, 60 illustrations, index. Sir Isaac Pitman and Sons Ltd. From The Aeroplane Book Department, 14, Bream's Buildings, E.C.4. 25s. net.

Admiral Sueter has written this book with the estimable object of refuting the wild and inaccurate statements contained in a book called *The Great Delusion,* by an anonymous writer.

The sub-title of Admiral Sueter's book is "Fair play for our airmen." Neither the title nor the sub-title is worthy of the book, which is not a religious tract but a vigorous and plain-spoken collection of facts, as Admiral Sueter sees them. The author has covered an enormous amount of ground—and sea—and has tackled a mass of debatable problems with courage and conviction.

The book might have been more valuable for reference purposes if its general arrangement had been more orderly, but, quite apart from its historical facts and the propaganda it preaches, it is a good story.

Admiral Sueter was Director of the Admiralty Air Department from 1912 to 1915, Superintendent of Aircraft Construction from 1915 to 1917, and in command of R N.A.S. Units, Southern Italy, in 1917 and 1918. The Naval Air Service might therefore be expected to play a large part in his book, but he has given it a part out of all proportion. The book might more aptly have been called, "A Defence of the R.N.A.S."

There are 94 pages under the chapter-heading of Naval Aviation, 57 pages about the R.N.A.S. Anti-Aircraft Corps and the R.N.A.S. Armoured Car Service, and about 40 pages on airships. There are nine pages only under the heading "Military Aviation."

In the course of a speech at a recent public dinner Admiral Sueter said that he had written a book, and therefore stood to be shot at, or words to that effect. In this he was perfectly right, but as a measure of compensation for being a target an author of a book is at liberty to grind axes or ventilate grievances, as the fancy takes him. But he should try to avoid becoming dull. So many crusades look like Sunday-school treats to the rest of the world.

One cannot help wishing that Admiral Sueter had forgotten Admiralty politics and stuck to his story. The history of the R.N.A.S. is quite entertaining enough in itself, but its struggle for existence in the abnormal conditions of war and its eventual demise is hardly a vindication of aviation as a whole.

Nevertheless, Admiral Sueter's enthusiasm is infectious, and his personal reminiscences include a lot of good stories. And, most important of all, Admiral Sueter has attained his objective in that he has confounded "Neon." He has exposed that writer's fallacies, denied his claims and refuted his arguments. Admiral Sueter has sunk at least one Noah's Ark. But even that is hardly a justification for the book's title, which is clumsy, and does not suggest anything in particular to the lay mind other than, perhaps, an effort to be facetious, which is a pity when the purpose is so serious.

C. M. McA.

For the Rising Generation.

Building and Flying Model Aircraft,—A Guide for Youthful Beginners in Aeronautics. 300 pages, with illustrations on almost every page. The Official Book of the Playground and Recreation Association of America. By Paul Edward Garber, U.S. National Museum, Smithsonian Institution. The Ronald Press Co., New York. $2.25. Supplied by The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4. 9s. net.

In these days when every young person is so keenly interested in aviation almost everybody has some young relation of either sex who is intent on flying. The youth of to-day intends to become an aviator just as in the older generation he intended to become an engine-driver. Model locomotives have been a joy to millions of children, young and old. Model automobiles have never had that same attraction, for they have always been incapable of taking care of themselves while in motion. But the model aeroplane has even greater charm than the model locomotive. There are no expensive tracks to lay, there is no need for a level surface, and the aero-model enthusiast can make his own models and even develop his own ideas in a way which has never been possible to the devotee of the model locomotive.

As the Hon. Edward P. Warner, Assistant Secretary for Aeronautics, Navy Dept., U.S.A., says in his foreword: "Thousands of boys have found the flying of models a delightful pastime, but it should be more than that." It should in fact be only a prelude to the serious study of aeronautics in which the model-maker may become either a great pilot, a great constructor, or a great designer." And, as the Hon. F. Trubee Davison, Assistant Secretary for Aeronautics, War Dept., U.S.A., says: "An air-minded childhood of to-day means an air-minded public to-morrow." In other words, those who encourage the youngster to make model aircraft are helping materially to make the nation air-minded,—besides helping to keep the children quiet.

Consequently the dissemination of the knowledge which is to be found in *Building and Flying Model Aircraft,* by Mr. Paul Edward Garber, of the Smithsonian Institute, will be good work well done.

Many years ago Mr. Wilfrid Aston, co-Editor of The Aeroplane in 1909, and since better known as motor correspondent of *The Tatler,* wrote a very good little book on the building and flying of model aircraft. Unfortunately he has since become interested in heavier matters, with the result that nothing has appeared so far on this side of the Atlantic to beat his book, which is now out of date and out of print. Therefore we must go across the Atlantic to assuage the desire of the British youth of to-day for information about building and flying model aeroplanes.

This book is very well done, and, like practically all American books, exceptionally well printed and illustrated. Opening with a chapter on building and flying models as a sport, illustrated incidentally with, among others, a couple of photographs from the deceased *Aero,* with which one was

ANOTHER

Atlantic Flight on Mobiloil

The first woman pilot to fly across the Atlantic.

Miss Amelia Earhart, an amateur aviatrix, and Mr. Wilmur Stultz have jointly piloted a three-engined Fokker Monoplane across the Atlantic.

Again the Atlantic has been conquered, and again, following the lead established by the epic lone flight of

COLONEL CHARLES LINDBERGH

the engines were lubricated perfectly throughout by a standard grade of Mobiloil—Mobiloil " B."

THE OIL FOR RELIABILITY

ANNOUNCEMENT OF THE VACUUM OIL COMPANY LTD., LONDON, S.W.1

intimately concerned, the book proceeds to tell something of elementary aircraft such as ordinary kites, box-kites, man-lifting kites, parachutes and boomerangs. One thinks that the latter subject might have been omitted, merely out of respect for the window-panes and even the skulls of the older relatives of the readers of the book. Personally one could always make a boomerang fly away quite successfully, but one could never make it come home again.

Then follows some discourse on gliders, both of the man-carrying and the model kind. Thereafter the author progresses to tools and materials for aircraft construction, a chapter which will doubtless keep its readers busy for a long time. Then the reader is told how to make wooden airscrews,—unfortunately the author inculcates an error into his pupils by using the word "propeller."

Next there is a chapter on how to make fittings for model aircraft, such as bearings for rubber-driven airscrews, hooks and attachments for such things, wing-clips, wing fastenings, and so forth. After that there are four chapters on various specific types of models.

This is succeeded by a series of short articles on the more famous model aeroplanes made in the United States. Afterwards the various types of tractor models and pusher models are discussed, followed by instructions as to how to make a model which will rise off the ground.

Undoubtedly from such subjects quite a great deal can be learned about the aerodynamic habits of aircraft, provided that the youthful reader is intelligent enough to understand and study what his model is doing,—for the better the model flies the less it looks like any known type of aeroplane.

After this a considerable amount of space is devoted to models of actual existing aeroplanes. This, while it does ensure the cultivation of a proper eye for an aeroplane, and gives the youngster a just sense of proportion, is of far less practical use than the building and flying of aeroplanes which are unlike anything.

There is quite an interesting short chapter on model balloons and also on how to make a compressed-air engine. Following that there is some quite readable matter on model "airplane" clubs and model aircraft contests, which should be read with care by those who are thinking of forming such organisations.

One does not say that a better book could not be written on the subject, but one does say that no better book exists, and it is a fairly safe present to give to any boy under the age of 15. After that he generally wants to become a pilot, or at any rate to have a hand in the building of a real aeroplane.—C. G. G.

A Rigger's Manual.

A Manual of Rigging for Aircraft. (Air Publication 1107.) 2nd Edition, 1927. From The Aeroplane Book Dept., 14, Bream's Buildings, E.C.4. Price 2s. net.

In this book, issued "for the information and guidance of all concerned," the would-be aircraft rigger will find set out in a clear, concise manner, an outline of the theory and practice of the rigger's art, together with an outline of so much of the theory of flight as is necessary to an understanding of the principles which govern rigging.

In addition he will find a considerable amount of information as to the various tools which can with advantage be used in practical rigging and much useful information as to practical procedure.

The book is well illustrated and comprehensive and can thoroughly be recommended as an introduction to the principles governing the rigging of aircraft. It is naturally designed more expressly for the information of Service personnel, but its value to those outside the Service is not thereby reduced.

THE GERMAN TRANS-ATLANTIC FLIGHT.

The following letter has been received :—

Sir,—I wish to thank you for your fine article on the German trans-Atlantic flight from East to West as being the only one I have so far read that places the facts in their true perspective. Especially timely is your remark that "one does not quite see how a flight with a German pilot in a German machine with a German engine affects the cartographic position of the Irish Free State's air force." I heartily welcome a statement making it perfectly clear that this flight is entirely a German achievement.

Had the two Germans not been such splendid sportsmen, Major Fitzmaurice would not now be enjoying his vicarious fame. They took him with them as an act of friendship, and his weight must have been rather a hindrance than a help at a time when every extra pint of petrol may make all the difference between success and failure.

The man's courage has no real bearing upon the case at all. In the possession of that quality he is by no means singular. Hundreds could have been found to take his place at a moment's notice. Such glory as is to be gained from this gamble with fate must surely redound solely to the German firm that produced the aeroplane, the German pilot who flew it, and the German baron who financed the enterprise.

(Signed) E. J. Harrison.

THE BOOK BOOM.

The Latest Books on Aviation.

Prices post free.

THE WAR IN THE AIR. Vol. II.
H. A. Jones. (Official History.) (With an Index for Vols. I and II). 18/–

ALL THE WORLD'S AIRCRAFT, 1927.
G. G. Grey and Leonard Bridgman. 42/9

THE ART OF FLYING.
Capt. Norman Macmillan. 5/4

MEMORIES OF LAND AND SKY.
Gertrude Bacon. 7/9

A.B.C. OF FLIGHT.
W. Laurence Le Page. 7/9

AIRMEN OR NOAHS.
Rear-Admiral M. F. Sueter, C.B., R.N., M.P. 25/6

PILOT'S "A" LICENCE (New Edition).
J. F. Leeming. 3/9

SKYWARDS.
Commander R. Byrd. 15/9

THE GERMAN-ENGLISH, ENGLISH-GERMAN MILITARY & AERONAUTICAL DICTIONARY.
Kurt Hilmar Eitzen. 8/6

AN APPROACH TO WINGED FLIGHT.
J. D. Batten. 5/4

THE ZEPPELINS.
Capt. Ernst Lehmann and Howard Mingos. 18/6

R.A.F. RHYMES OF 'IRAQ.
Flt. Lt. A. E. Vautier. 2/1

AERIAL PHOTOGRAPHY.
Clarence Winchester & F. L. Wills. 25/6

AIRCRAFT AND COMMERCE FOR WAR.
J. M. Spaight. 6/4

FIXEL'S LAW OF AVIATION.
Rowland W. Fixel. 25/6

BUILDING AND FLYING MODEL AIRCRAFT. (A Handbook.)
Paul Edward Garber. 9/6

TECHNICAL REPORT OF THE AERONAUTICAL COMMITTEE FOR 1926-7. 35/9

Books which are not concerned with Aviation but have been reviewed in "The Aeroplane."

THE CULT OF THE PEACOCK ANGEL.
R. H. W. Empson. 15/6

UNLAWFUL.
Charles Turner. 7/9

THE DEVIL'S DAGGER.
Maurice Kiddy. 7/9

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FLOATS
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DE-HAVILLAND
MOTH SEAPLANES
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T.2.
G. THARRATT.

A NORTH POLE CELEBRATION.

On Wednesday, June 13, the "Big Four" of Aviation, namely the Royal Aeronautical Society, the Royal Aero Club, the Air League of the British Empire, and the Society of British Aircraft Constructors, gave a lunch at the Savoy to Capt. Sir Hubert Wilkins, M.C., and Lieut. C. B. Eielson in recognition of their Polar flight. Brigadier-General Lord Thomson, P.C., C.B.E., D.S.O., was in the Chair, and the assembled company was thoroughly representative.

Lord Thomson, introducing Sir Hubert, expressed appreciation of their splendid services. He remarked that Sir Hubert Wilkins was a descendant of that Bishop Wilkins of Chester who over 400 years ago experimented in aviation. The Bishop had also recommended as necessary the sending of expeditions to the Arctic Circle in the interests of humanity to forecast seasonal variations. Sir Hubert himself went to the Arctic to save humanity from its ignorance of meteorology and not merely to fly over the Pole.

Sir Hubert Wilkins said that his interest in the expedition was not primarily aeronautical. He knew that aircraft could be used because the atmosphere was not very different at 9 degrees latitude from what it was at 89 degrees. Consequently they decided to use aircraft for rapid transport.

Difficulties of flying in the Arctic were not very great. Engines had to be cowled to protect them against the cold. And at night they could be kept from freezing by hanging an ordinary lantern under them.

The greatest difficulty was the variety in compass declination. In their voyage from Point Barrow to Spitzbergen they did not meet this by using the sun compass as Lieut. Byrd had done in his Polar voyage but they minimised the compass variation by following Grand Circle navigation instead of going direct over the Pole. In work of this kind complete co-operation was necessary between pilot and navigator and without a perfect pilot such work was impossible.

He said that in the course of their voyage they found no islands on which they could establish the meteorological stations which he hoped to form, consequently they would have to put their stations on floating ice.

When he got to Berlin on his arrival in Europe he found that there already existed there the Aero-Arctic Society for the purpose of investigating Arctic meteorology. He said that he thought that in the Polar regions air transportation was quite possible and he intended working on the same principle in the Antarctic. In order to get proper meteorological knowledge simultaneous observation was necessary at each Pole.

Lieut. Eielson, who is incidentally the first man to enter Europe from America for the first time over the Pole, expressed his appreciation of his reception and said the trouble with us in England was that we had not given enough credit to our own pioneers. Alcock and Brown were the first people to fly the Atlantic and yet most people in the World were under the impression that Lindbergh was the first,—which he said, in no way detracted from his admiration of the latter.

ARCTIC FLYING.

For the meeting of the Royal Aeronautical Society on Thursday, June 14, Capt. Sir Hubert Wilkins, M.C., wrote one very interesting paper on Arctic flying, and delivered a totally different and equally interesting lecture.

The lecturer said that the possibility of using aeroplanes for Arctic exploration first occurred to him in 1913 when with Stefansson's Expedition. Travelling on foot seemed to him unduly laborious, and some experience of flying led him to recognise that the Arctic afforded plenty of possible landing places.

It was not till 1926 that he was able to put his ideas into practice. His object was not Polar exploration, but to try and find possible sites for meteorological stations in latitude 80°, between 180° and 135° west. To do this two Fokkers—one with a Liberty engine and one with three Wright Whirlwinds—were sent to Fairbanks, Alaska, assembled, and flown to Point Barrow.

Here both machines were damaged in trial flights, and by the time repairs were complete it was too late in the season.

In 1927 a lighter type of machine—a Stinson biplane—was taken to Point Barrow, to make flights of about 500 miles out and home in N.E. and N.W. directions, and look out for land. If no land were seen a landing was to be made on the ice and soundings taken.

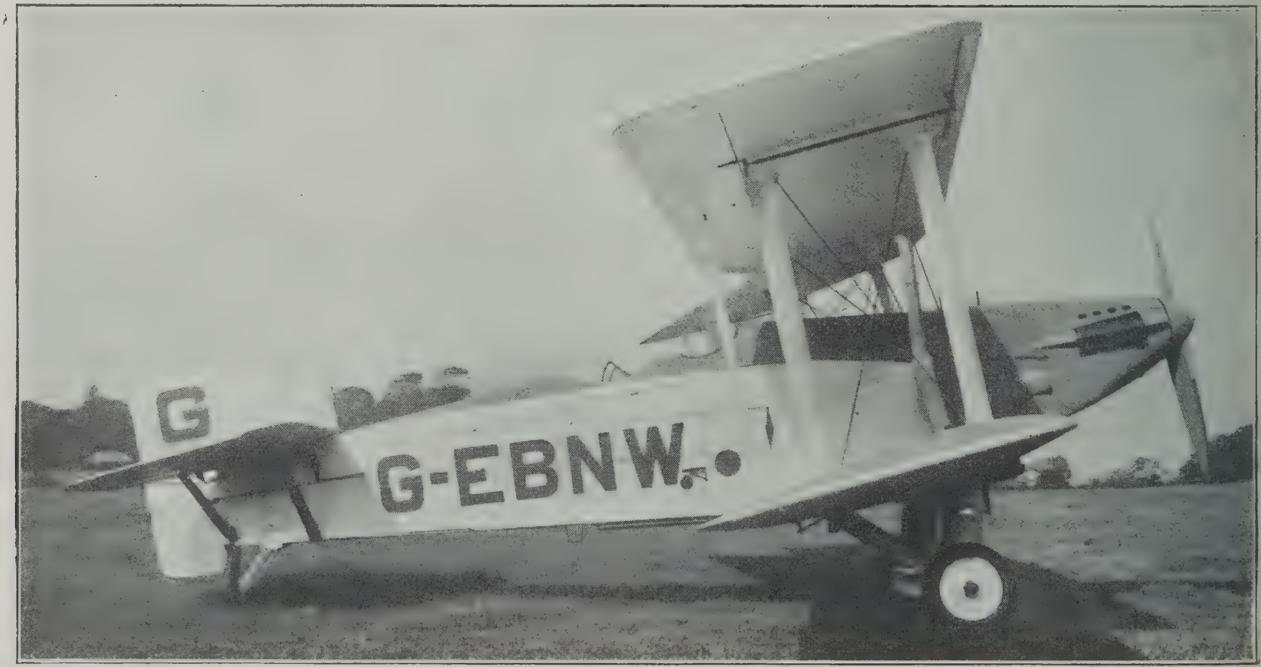
The scheme was to take advantage of a local storm always found at Point Barrow early in April, fly out with it, then fly south in relative calm, and finally turn east when the storm should again be met, and but this time blowing from the west.

Unfortunately, they had a forced landing, caused by an obstruction to petrol flow plus magneto trouble. This landing was used to take a sounding showing 5,400 metres of sea, and little promise of land. After taking off, the trouble developed again. Another landing was made and the trouble cured. But the storm did not behave as per schedule, and produced a head instead of a tail wind on the last leg home. They ran out of petrol 75 miles from home in the dark. Eielson pulled off a safe landing almost by a miracle, and it took 13 days crawling over the ice to get back to land.

For the 1928 expedition, staff, equipment and expense was cut down to the minimum. A Lockheed Vega monoplane (Wright Whirlwind engine) was chosen as the lightest and fastest machine capable of carrying the necessary equipment, food and fuel for a flight from Point Barrow to Spitzbergen. This machine, weighing 1,600 lbs. empty, actually took off with 3,400 lbs. of load and flew to Spitzbergen in about 23 hours, so that the choice was justified.

The programme was to fly N.E. from Point Barrow, and if land were seen in the first 600 miles to land, dump part of the load, and proceed. Otherwise the flight was to be unbroken. The course planned took them a little north of Grant Land, which should serve as a check on their navigation about halfway through the flight.

When the position from which the Grant Land peaks should have been seen was reached there was nothing but cloud to be seen to the south, but a twenty-mile detour south revealed the hoped-for mountains, and the journey proceeded.



THE AVRO BUFFALO II.—A side view of the two-seat torpedo-bomber produced by A. V. Roe and Co. Ltd. The engine is a Napier Lion XA which gives 553 h.p. at 2,350 r.p.m.

For Business or Pleasure The Ideal Light Aeroplane.

THE Westland Widgeon III.—The most practical proposition for private owners, and for club and school use, etc. Strongly built with stout steel-sprung undercarriage; wings braced with struts, no rigging to need adjustment. Excellent view for pilot and passenger due to parasol construction. Furnished with British Air Ministry Aerobatic Certificate. Can be fitted with dual control. Low petrol consumption (15-20 m.p.g.). High touring speed (80-90 m.p.h.). Wings fold for garaging in small space. Fitted with Cirrus II Engine. Price: £750, ready to fly away.

Latest Success. Air League Challenge Cup won by a private owner flying a Westland Widgeon at the Midland Aero Pageant, June 9th, 1928.

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(Branch of Petters Limited)
YEOVIL, ENGLAND.

The WESTLAND WIDGEON

At Spitzbergen again the land was covered in clouds. The cloud formation showed that land was there, and it could only be Spitzbergen, but much groping in the cloud uncomfortably close to mountainous peaks was necessary before a landing space could be found on the ice in a bay.

After landing it was necessary to wait five days before the weather cleared sufficiently to take off and fly to Green Harbour—which was about 75 miles away. No trace of new land was seen anywhere on the journey.

The paper as written contains a good deal of interesting information concerning flying conditions in the Arctic, navigation in those regions, and the like. According to the author no difficulty is found either with air or water-cooled engines in temperature down to —40°, provided that the engines are properly protected when at rest. On the flight to Spitzbergen a temperature of —48° was met, and this caused a dangerous fall in oil temperature. To overcome this Eielson ran his engine all out at climbing air speed, and side-slipped to keep his altitude down—a process which meant an excessive fuel consumption. More complete cowling of the engine and some equivalent to radiator shutters are desirable for air-cooled engines.

Eielson and himself were kept warm and comfortable by Eskimo suits weighing about 9 lbs. each made for them by the Eskimo women at Point Barrow. These suits were suitable for any temperature between 90° and —50°, provided one did not attempt concessions to civilised ideas like wearing silk underwear beneath them.

Navigation in these regions was less complicated than might be expected. On their flight the big changes in direction necessary, together with the enormous variation in compass declination which was encountered, made it appear as though the keeping of compass courses would be difficult.

Observations of the sun by R.A.F. bubble sextant, reduced by a method devised for this trip by Mr. O. O. Miller, of the American Geographical Society, gave very satisfactory fixes.

Generally, the Arctic was the calmest region on the earth. Strong winds were met only near land. Far north it seemed always to be calm. Fog and low cloud seemed all to keep below 4,000 ft. Here it made observation of the surface impossible, but did not interfere with navigation. He had never been troubled by the formation of ice on his machine.

THE AVRO "BUFFALO MK. II."

The Buffalo Mk. II is one of the new class of two-seater Torpedo-bombers, designed and constructed by A. V. Roe and Co. Ltd. to the requirements of the British Air Ministry. It has interchangeable wheel and float undercarriages.

This machine is an equal-winged tractor biplane of mixed metal and timber construction fitted with one Napier Lion Series XA engine of 550 b.h.p.

The wings both top and bottom consist of one wide centre-section, built into the fuselage in the case of the lower wing and carried on splayed struts in the case of the upper wing. There is one single row of interplane struts on each side with the usual streamline wire bracing. Ailerons, balanced on inset hinges, are fitted to both wings, and Handley Page Slots, working in conjunction with the ailerons, may be fitted if required. The wings have a slight dihedral, and a marked sweep-back.

Wing spars are of spruce, and the ribs are Warren girders with spruce flanges and duralumin bearings. This particular form of rib has been used very extensively by A. V. Roe and Co. and is simple to manufacture.

All drag struts are steel tube, and drag bracing is by swaged rods.

The fuselage is of steel tube throughout, with mechanical joints braced with standard tie-rods and is fabric-covered. Engine and the fore part of the upper deck cowling is of sheet aluminium fitted with quickly detachable clips. The fuselage structure is easily dismountable into a number of sections for either transport or repair.

The pilot's seat is arranged high up in the fuselage, just behind the trailing edge of the centre section. The pilot has an excellent view above the top wing, his view straight ahead thanks to the slope of the upper deck down to the fine nose of the body is good for a machine of this size, and the narrowness of the fuselage gives a first-rate landing view.

The gunner-observer's cockpit is close behind that of the pilot. It is exceptionally roomy, thus permitting the whole of the very complex military equipment to be arranged in an easily-used form. For bombing the observer may take a prone position in the bottom of the fuselage.

The undercarriage of split-axle type is supported by two Vees attached to the lower centre section spars.

The front leg of each Vee telescopes on rubber compression blocks and an oleo-damper.

The tail-unit is of conventional type, built on spruce spars for the tail plane.

The power plant consists of one Napier Lion series XA engine with a normal output of 553 h.p. at 2,350 r.p.m.

The engine is cooled by a long-tube honeycomb radiator carried behind and below the engine which can be withdrawn inside the body. There is a water header tank of 3½ gallons water capacity above the engine which has adequate room for all water expansion and which is so built that even if the water boils no water can be blown out of it.

A main fuel tank of 145 gallons capacity and a gravity feed tank of 15 gallons capacity are fitted. Fuel is supplied from main to gravity tank by a windmill-driven pump, passing through a flow indicator in the cockpit so that the pilot may always see if the pump is working. Any excess fuel over that consumed by the engine returns to the main tank by an overflow pipe. A hand petrol pump serves as a reserve to the wind-driven pump.

Oil tanks of 13 gallons capacity plus 7 gallons expansion space, are carried in the fuselage. They are fitted with air tubes for cooling the oil, and scoops in the cowling supply the necessary air blast for this cowling.

To convert the machine to a seaplane it is fitted with a pair of long single-step floats, entirely of duralumin.

All steel fittings, bolts, pins, and the like, on the float undercarriage, are of stainless steel.

SPECIFICATION.

DIMENSIONS.—Span 46 ft. 0 in. (14.0 m.), Length 37 ft. 3 in. (11.3 m.), Height, tail up 14 ft. 9 in. (4.42 m.), tail down 14 ft. 0 in. (4.27 m.), Wing area 684 sq. ft. (62.5 sq. m.).

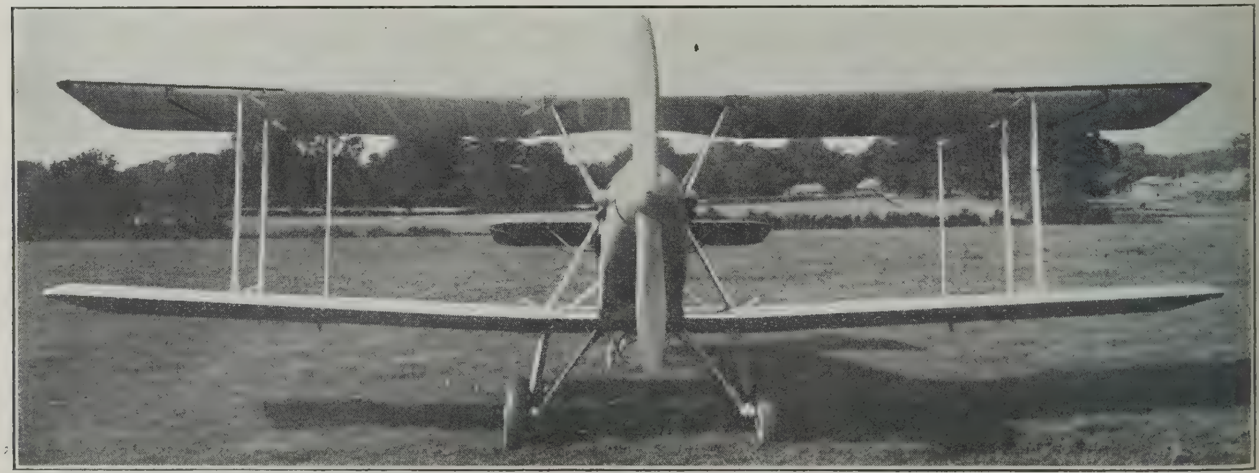
WEIGHTS AND LOADINGS.—(Land Machine) Weight empty 4,233 lbs. (1,920 kg.), Weight loaded 7,420 lbs. (3,375 kg.), Wing loading 10.85 lbs./sq. ft. (54 kg./sq. m.), Power loading 13.3 lbs./h.p. (6 kg./h.p.).

PERFORMANCE.—(Land Machine) Max. speed at sea level 135 m.p.h. (218 km.h.), at 10,000 ft. (3,050 m.) 123 m.p.h. (198 km./h.), Minimum speed 60 m.p.h. (96 km./h.), Rate of climb at sea level 770 ft./min. (234 m./min.), Climb to 5,000 ft. (1,525 m.) 8 mins., to 10,000 ft. (3,050 m.) 21 mins., Service Ceiling 13,700 ft. (4,170 m.).

WEIGHTS AND LOADINGS.—(Seaplane) Weight empty 4,684 lbs. (2,128 kg.), Fully loaded 7,871 lbs. (3,578 kg.), Wing loading 11.5 lbs./sq. ft. 57.2 kg./sq. m.), Power loading 14.23 lbs./h.p. (6.5 kg./h.p.).

PERFORMANCE.—(Seaplane) Max. speed at sea level 130 m.p.h. (210 km.h.), at 10,000 ft. 115 m.p.h. (185 km.h.), Minimum speed 62 m.p.h. (100 km.h.), Rate of climb at sea level 640 ft./min. (195 m./min.), Climb to 5,000 ft. (1,525 m.) 9.8 mins., to 10,000 ft. (3,050 m.(30 mins., Service ceiling 11,000 ft. (3,355 m.).

Note.—The performances above mentioned both for the land and seaplane are with an airscrew designed to work at 10,000 ft. The performance specified is guaranteed to plus-minus 2½ per cent.



THE AVRO BUFFALO II.—The front view of the latest Avro torpedo-bomber. Handley Page slot and aileron control are visible on the top plane.

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THE ARMSTRONG SIDDELEY LEOPARD AERO ENGINE.

The 700-750 h.p. Armstrong-Siddeley Leopard engine has been designed and developed by Armstrong Siddeley Motors Ltd. of Coventry for use in torpedo, heavy bombing and load-carrying aircraft, and is believed to be the most powerful air-cooled radial engine in production in the world.

The general lay-out and design follows very closely that of the same company's well-known Jaguar engine, and consists of two "banks" or rows, each comprising seven cylinders mounted radially on the crankcase.

The principal departure from the Jaguar design is that the induction fan is geared to run at a higher speed than the crankshaft in order to obtain a better volumetric efficiency, and that four valves are fitted to each cylinder instead of two, this being rendered necessary by the increased cylinder capacity.

Crankcase.

The crankcase is a one-piece aluminium casting, the front portion carrying the tappet guides, and a spigot which supports the front cover and the front crankshaft-bearing. The central portion, or barrel, which carries the cylinders, is very heavily webbed both inside and outside. The rear portion has a spigot, which supports the induction fan and casing, the petrol-pump, carburettor and the rear crankshaft-bearing.

Cylinders.

The steel cylinder barrels are secured to the crankcase by clamping rings, which are of a wedge-shaped section, these details following standard Armstrong Siddeley practice. The cylinder-head, an aluminium casting, is screwed and shrunk on to the cylinder barrel, where it is secured permanently by a screwed locking-ring, which makes a metal-to-metal joint. Here again well-tried Armstrong Siddeley practice is retained.

Two inlet and two exhaust valves per cylinder are operated by rockers, which pivot on two spindles mounted on the cylinder-head. These spindles at their rear ends are anchored to the top of the head; their front ends are supported by a compensating bracket, which is anchored to a point near the bottom of the cylinder-head.

This bracket is made of a special steel with a very low co-efficient of expansion, with the result that the longitudinal expansion of the cylinder has practically no effect on the tappet clearances. This means that adjustment to the tappets is very seldom called for and that starting up is made much easier. The valve seats and valve guides are renewable, the former being screwed and shrunk into the heads while the latter are a press fit. The sparking plugs fit into adaptors which are screwed and pegged into the cylinder heads.

Valve Gear.

The valve rockers are operated by push-rods and tappets from the cam-drum which is inside the front portion of the crankcase. Tappet clearance adjustment is provided in the push-rods.

The cam-drum has three inlet cams and three exhaust cams and rotates at one-sixth crankshaft speed. Rollers and tappets transmit the cam motion to the push-rods.

Pistons.

The pistons are machined all over from "Y" alloy forgings. Each carries two compression and one scraper ring, all three rings being above the gudgeon-pin. The gudgeon-pin floats in the piston and connecting-rod bush and is located endways in order to prevent scoring the cylinder walls.

Connecting-rod Assembly.

Each "bank" of seven cylinders and pistons drives the crankshaft by means of one master and six auxiliary connecting-rods. The large end of each master connecting-rod carries six anchor-pins, to which the inner ends of the auxiliary connecting-rods are anchored. The master connecting-rods are bushed to take the anchor pins which float in the bushes and are spaced so as to give an equal compression ratio in every cylinder. The master connecting-rods have big-ends with white-metal bushes which are made in two halves and prevented from turning in the master rods by dowels.

Crankshaft.

The crankshaft is made in one piece and has two throws set 180° apart, each crank-pin carrying one master rod and six auxiliary connecting-rods. It is hollow and serves the purpose of distributing the lubricating oil. It is carried by two large roller bearings, one just behind the rear crank-throw and the other just in front of the front crank-throw.

The crankshaft, beyond its front roller bearing carries the timing-gear and cam-drum, a bevel gear (which drives the oil pump, magnetos, gas distributor and C.C. gun gear), and the airscrew thrust-bearing. The rear end of the crankshaft carries the spur gear which drives the induction fan. The front and rear webs of the crankshaft are counterbalanced.

Induction System.

Mixture is supplied to the engine by a Claudel-Hobson carburettor through an induction fan which delivers the mixture into an annular induction-casing. Thence the mixture passes to the cylinders by means of induction pipes. Experiments have proved that the use of an induction fan of this kind considerably increases the volumetric efficiency of the engine and gives a perfectly even distribution to all cylinders.

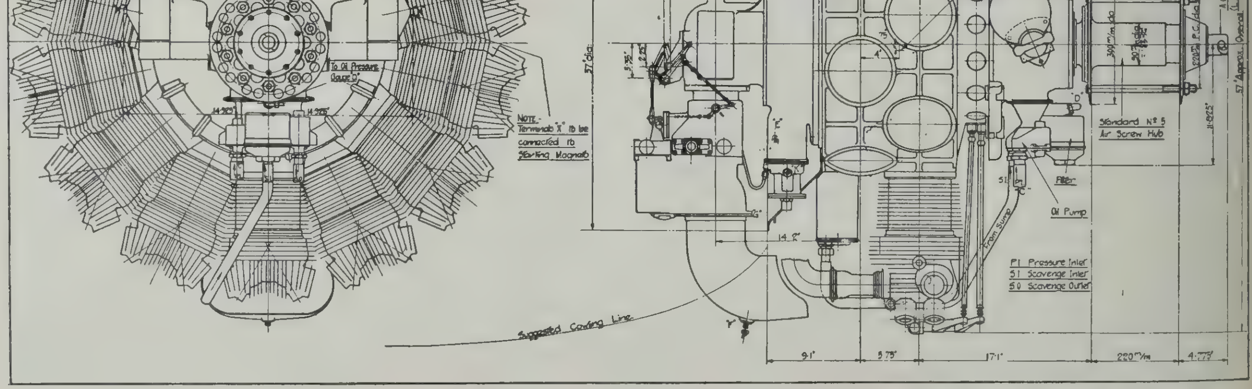
The carburettor is supported on an induction elbow attached to the rear end of the engine, the controls and air-intake pipes being integral with the carburettor and engine.

Ignition.

Ignition is controlled by two magnetos of the latest approved type, each having fourteen terminals. The magnetos are accessibly mounted on the front of the engine and are bevel-driven from the crankshaft. There are two sparking plugs per cylinder, the braided H.T. cables being supported in a wire carrier mounted on the crankcase. Fine adjustment of the magneto timing is provided by serrated couplings incorporated in the magneto drive.

Auxiliary Equipment.

A distributor for a gas starter which is mounted on the



Installation Drawings of the Armstrong Siddeley Leopard fourteen-cylinder air-cooled radial engine of 700 h.p.

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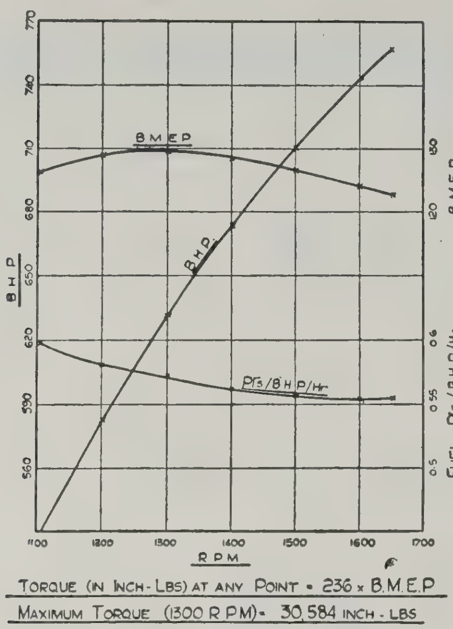

The Power Curve of the Armstrong Siddeley Leopard Engine.

front of the engine is driven from the crankshaft, and the cams for the C.C. gun gear are contained in the same casing.

The oil pumps, mounted on the front of the engine, are driven from the crankshaft, through bevel gears. The pressure pump delivers oil under pressure through a relief valve and a filter to the centre of the crankshaft and thence to the connecting-rods and bearings. At the botto mof the crankcase are an oil-sump and filter into which the oil drains from the engine. When the engine is stationary the surplus oil passes from the crankcase and collects in this sump, and flooding of the crankcase and lower cylinders is prevented.

Oil is drawn from the sump by a scavenger pump situated underneath the pressure pump, and is then delivered to the oil tank on the aircraft. On its way to the tank, the oil passes through the jacketing of the carburettor and induction elbow, thereby heating the induction system.

A gear-type petrol-pump and relief valve are fitted at the rear end of the engine.

A tachometer-drive is fitted to the engine just above the petrol pump.

A distributing ring for priming is fitted at the rear of the engine, with small branch pipes leading to each induction pipe. Each branch pipe terminates with a small atomising jet discharging into the induction pipes. A primer pump, filter and T-piece for feeding the priming system are supplied with the engine.

A conical steel bearer-plate for mounting the engine on the aircraft is attached to the rear of the crankcase.

Specification of the Armstrong Siddeley Leopard Engine.

Made by Armstrong Siddeley Motors Ltd., Coventry.

Type.—Double-row, air-cooled, fourteen-cylinder radial.

Cylinders.—Bore 6 in (152 m/m.), Stroke 7½ in. (190 m/m.), Compression ratio 5/1. Barrels machined from steel forgings with integral fins. Aluminium alloy heads screwed onto barrels and locked by a ring-nut. Four inclined valves per head, seating in screwed-in aluminium-bronze seats. Barrels held in crankcase by wedge section clamping rings.

Valve Gear.—Valves operated by push-rods and rockers from a cam-ring concentric with crankshaft. A compensating device to maintain constant tappet clearance over the working range of cylinder temperature is embodied in the rocker-spindle supports. The cam-ring runs at one-sixth crankshaft speed and has three inlet and three exhaust lobes.

Pistons.—"Y" alloy forgings machined all over. Three rings, one a scraper, above gudgeon-pin. Gudgeon-pin floats in piston and in little-end bushes.

Connecting-rods.—One master rod for each bank of cylinders carries a split white-metal-bushed big-end, and bronze-bushed bearings for anchor-pins of six auxiliary rods.

Crankshaft.—Two throws at 180°, machined from one forging, fitted with balance-weights on each throw. Supported in two main roller bearings, and one ball-thrust bearing.

Crankcase.—Main crankcase drum carrying both banks of cylinders is a single aluminium-alloy casting. A front cover casting spigoted to the main casting carries front crankshaft bearings, and encloses the cam-ring and gear drives for cam-gear, magnetos, oil pumps, gas-starting distributor and gun gear. The rear cover carries the rear crankshaft bearing and forms an induction fan casing.

Auxiliary Gears.—Arranged in two groups, one in front and one behind the cylinders. In front, the cam-ring concentric with crankshaft is driven by an epicyclic train. A single bevel gear on the crankshaft ahead of the cam-gear drives two transverse shafts for magnetos, a vertical shaft for oil pumps below the crankshaft, and a vertical shaft for the gas-distributor and gun gear cams above the crankshaft. The rear group consists of a spur gear train for the induction-fan, and drives for a gear type petrol pump and rev.-counter.

Induction System.—Claudel-Hobson type A.V.T. 100 carburettor supplies mixture to the centre of the induction-chamber in the rear cover of crankcase. This chamber encloses a centrifugal fan, gear up from crankshaft, which delivers to seven tangential induction pipes, each forked to supply one cylinder in each bank.

Lubrication.—Dry sump pressure system. Pressure pump forces oil through hollow crankshaft to main and big-end bearings. Scavenger pump returns oil from sump to tank via a passage surrounding the intake to fan chamber.

Overall Dimensions.—Diameter 57 in. (1.45 m.), Length, mounting face to extreme front, 45.3 in. (1.16 m.), Diameter of mounting circle 37 in. (0.94 m.).

Weight Complete.—1,415 lbs. (643 kg.).

Performance.—Normal output 700 b.h.p. at 1,500 r.p.m., Maximum 777 b.h.p. at 1,650 r.p.m, Fuel consumption at normal output 0.56 pints = 0.53 lbs. (0.32 litres = 0.24 kg.) per h.p. hour.

A MATTER OF AIRSCREWS.

The following letter has been received :—

Sir,—To the technical mind the remarks applying to air screws on page 128 of "The Art of Flying" should, from the context, be known to apply to propellers which are fitted to small and medium-size aeroplanes equipped with engines which produce power at high revolutions, thus creating a high propeller tip-speed. These propellers are necessarily comparatively small, and to-day run to about ten to eleven feet maximum diameter. Nevertheless, conditions do obtain where propellers of this type are not superior to other existing types, and, in writing this paragraph, this fact was inadvertently not brought out; in the non-technical mind an impression of inferiority might thus be created against the steel propeller.

No such intention was sought by the author. Actually, steel propellers are to be fitted to H.M. Airship R.101, in which case the large diameter of these propellers enables the hollow steel blade to be made lighter than an equivalent solid duralumin blade. Further, two of the four Supermarine Southampton Flying-boats, one of which is illustrated in "The Art of Flying," which are flying on an Empire Cruise, are fitted with steel propellers, which have given excellent service.

The writer regrets any suggestion of unfairness against the steel propeller which might be imputed to his book, and offers apologies to the manufacturers of Leitner-Watts steel-bladed propellers, and any other manufacturers of steel airscrews, whose products enter a field of airscrew requirements which are to-day largely complementary to that of the duralumin propeller and which, with future development, will compete with them in the smaller diameter airscrew.

The following errata sheet has been added to "The Art of Flying" against page 128 :—

Page 128. Lines 14, 15, 16, 17. This sentence applies solely to propellers fitted to small and medium-size aeroplanes equipped with engines which produce power at high revolutions, thus creating a high propeller tip-speed. Steel and duralumin propellers are largely complementary, overlapping occurring at diameters between nine and ten feet. In the larger diameters the hollow steel blade gains the advantage of lighter weight when well designed. Two of the four Southampton Flying-boats flying on the Empire Cruise are equipped with steel propellers, which have given excellent service, and manufacturers of this type of airscrew are designing airscrews for H.M. Airship R.101, and are now in process of developing propellers for light aeroplanes to compete with the small diameter duralumin airscrew.

(Signed) Norman Macmillan.

THE LIMITATIONS OF SLOT CONTROL.

In a short article which appeared recently in The Aeroplane the opinion was expressed that three fatal aeroplane accidents which had happened some time previously might have been avoided if the machines had been fitted with slots. Since then one has learned that one of the machines had in fact slotted wings.

Information received concerning that accident indicates that the pilot was doing a very steep climbing turn at such an angle, both fore-and-aft and laterally, that the machine was badly over-banked and at the same time had lost its forward way. The result appears to have been that the machine simply slid down sideways on one wing-tip, all support from the air having been removed.

The result was practically what used to be called an Immelmann turn so low down that the machine hit the ground before the pilot could get any control over it.

Slots opposite the ailerons will prevent a machine from rolling over sideways and spinning if the machine is stalled in anything like a flying attitude. But no human mechanism will stop a machine from falling sideways when it is already over-banked and has lost headway.—C. G. G.

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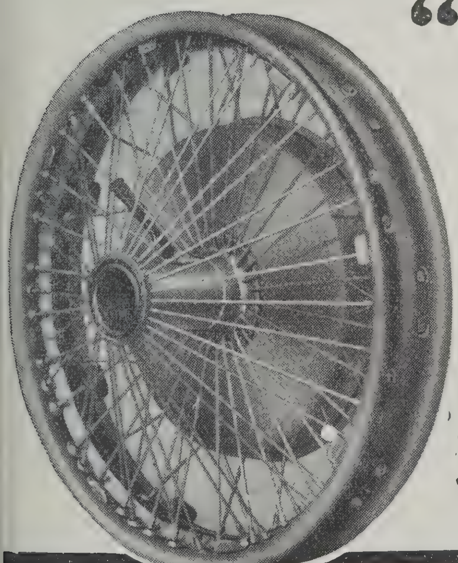

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Report for week ending June 17.

Flying Time 51 hr. 30 min. *Instruction* 17 hr. 40 min. *Soloists* 33 hr. 50 min. *Instruction.—With Mr. S. L. F. St. Barbe*—Miss V. M. Cholmondely, Miss Johnson, Miss Fletcher, Miss Wilson, Messrs. H. R. Presland, A. Courtauld, P. A. Wills, H. Sutton, J. C. V. K. Watson, J. R. Rymill, B. Carey, J. R. A. Stroyan, E. G. Amsden, J. A. Crane, G. E. Clair, Major R. M. S. Veal. *With Mr. F. R. Matthews*—Messrs. J. Bickley, E. A. Lingard, J. R. A. Stroyan, D. G. Prentice, C. Reilly, C. W. Bonniksen, I. E. Furlong, C. N. Green, G. H. N. Larden, C. G. W. Ebbutt. *Soloists.*—Major K. M. Beaumont, Major R. M. S. Veal, Lord M. Douglas-Hamilton, Messrs. W. Roche Kelly, R. Sanders Clark, J. C. V. K. Watson, H. B. Michelmore, H. M. Samuelson, J. J. Hofer, E. R. Andrews, Art. Fowler, Will Hay, E. E. Fresson, P. W. Hoare, J. A. Brewster, F. C. Fisher, G. W. Hall, N. J. Hulbert, L. J. C. Mitchell, E. E. Stammers.

FLYING CHARGES.—The following charges will come into force on July 1, 1928:—

Flying Instruction.—The charge will be at the rate of £2 per flying hour for the first twelve hours. For any time in excess of twelve hours the charge will be at the rate of £3 per flying hour.

Solo Flying.—The charge will be at the rate of £1 per flying hour up to twenty hours in each Club year. For any time in excess of twenty hours in each Club year, the charge will be at the rate of £1 10s. per flying hour. Any ordinary member who shall not, in the opinion of the Instructor, be qualified to fly solo after fifteen hours' dual instruction, shall automatically cease to be an ordinary member.

Flying Time.—Members are informed that Flying Instruction will now be given from 6 a.m. to 11 a.m. and from 5 p.m. till dusk, Mondays excepted.

The Lancashire Aero Club.

[Sec.: Woodford Aerodrome, near Stockport.]

Report for week ending June 16.

Flying Time 30 hr. 20 min. *Instruction* 14 hr. 55 min. *Soloists* 11 hr. 30 min. *Passenger Flights* 2 hr. 45 min. *Tests* 1 hr. 10 min. *Instruction.—With Mr. Baker*—Miss Baerlein, Messrs. Garner, Taylor, S. Nelson, J. G. Williamson, Benson, Riley, Fallon, Mason, Faulkner, Greenhalgh, Serck, Pattrieoux, Kay, Ashworth, Hall, Gort, Barlow, Sellers, Hartley. *With Mr. Cantrill*—Miss Baerlein, Mr. Ashworth. *Soloists (under instruction).*—Miss Baerlein, Messrs. Gort, Garner, Riley, Harrison, Sellers. *Pilots.*—Messrs. Nelson, D. Caldecott, Meads, Williams, Twemlow, Chapman, Lacayo, Agar, Harber, Hardy, Ruddy, Brooking, Michelson, Hall, Leeming, Fallon, Cohen. *Passengers.—With Mr. Lacayo*—1. *With Mr. Hall*—3. *With Mr. Baker*—5. *With Mr. Twemlow*—1. *With Mr. Williams*—1.

No real crashes this week—only a broken con-rod and a completely smashed engine.

Mr. Harrison completed the tests for his "A" Licence and Mr. Riley his height test.

Owing to the exceptionally large number of machines entered for the Blackpool Air Pageant, it is regretted that no late entries can be accepted.

The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. J. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for fortnight ending June 16.

Flying Time 36 hr. 10 min. *Instruction* 14 hr. 10 min. *Soloists* 18 hr *Passengers* 4 hr. *Instruction.—With Mr. Beck*—Mrs. Earle, Messrs. Ambler, Arundel, Bell, Blackburn, Brown, Collins, Dujardin, Fitton, Gill, Ives, Little, Lupton, Ostler, Park, Reynolds, Rowley, Senior, Shires, Wilson. *Soloists.*—Messrs. Brown, A. Crowther, Dick, Ostler, Reynolds. *"A" Pilots.*—Messrs. Ambler, Birch, Clayton, H. Crowther, Dawson, Ellison, Humpheries, D. Lax, Lister. *Passengers.*—18.

On June 3 a little diversion from ordinary routine was enjoyed by way of a Forced Landing Competition, in which some 14 members took part. Mr. Beck, the pilot instructor, acted as an emergency passenger in each case. The winner was Mr. Jack Ellison, a Club *ab initio* pupil of some few months' standing. He made a really stylish approach, a perfect landing, and finished up within a yard or two of the mark.

Since our return from the Midland Pageant we have enjoyed but three days' flying, with two machines, through rain, gales, storms—in fact the usual summery conditions of this country. On Tuesday, however, we did something in the way of achievement by getting Mr. Ostler to take the air on his own and in no mean style. Mr. Ostler's visits to the aerodrome have been few and far between through no fault of his own, but one hopes that now his ambition has been reached, he will earn that £50 before the end of July.

Mr. Downer, who was navigator to Mr. Frank Courtney on his recent Atlantic attempt, is attending the Club each Wednesday, giving a series of lectures on Navigation. The second class was well attended by a dozen or more enthusiastic members.

Yesterday we arranged a meeting of the Directors and active members to give the latter the opportunity to criticise the Club's policy and to make suggestions in the furtherance of its interests. We very much appreciated the fact that Lady Heath's enthusiasm brought her all the way from London to attend this meeting and propound some very helpful ideas.

The Norfolk and Norwich Aero Club.

[Manager: Basil Young, The Aerodrome, Sprowston.]

Report for week ending June 17.

Flying Time 20 hr. 30 min. *Instruction.—With Mr. Young*—Messrs. C. Mills, G. Watson Parker, H. Clarke, F. Rinder, A. Cooper, F. W. Palmer, H. Cator, H. Neave, G. Wharton. *Soloists.*—Messrs. R. T. Harmer, F. Gough, E. Lambert, G. F. Surtees, G. Barker, R. Potter, A Cooper, W. A. Ramsay, W. Cubitt, E. Varden Smith, H. Mack, *Passengers.*—10.

Weather again unkind to us and has kept our flying time down. Everybody is going to take up instruction when the warm weather comes—this leaves us in a quandary—we don't know whether to call them optimists or pessimists.

Fancy landings look very graceful sometimes unless one happens to land on one wheel and bend the axle. Then the atmosphere surrounding becomes distinctly disgraceful. We've had some.

Mr. A. Cooper is to be complimented on his first solo. Excellent show, fine landing. We are very pleased to see Mr. Cooper go off. He has tried very hard. He has been known to wade through the snow up to Mousehold at 7.30 a.m. just to fly, but this only goes to show that perseverance wins in the end.

Messrs. G. F. Surtees, E. Lambert and G. Barker have completed their tests and now await the pleasure of the Air Ministry for their "A"s.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, The Aerodrome, Hamble.]

Report for week ending June 17.

Flying Time 45 hr. 45 min. *Instruction* 14 hr. 45 min. *"A" Pilots* 13 hr. 35 min. *Soloists* 12 hr. 10 min. *Passenger Flights* 4 hr. 10 min. *Tests* 1 hr. 5 min. *Instruction.—With Flt. Lt. Swoffer*—17. *"A" Pilots.*—8. *Soloists.*—11. *Passengers.*—10.

We have suffered from the general complaint, i.e., high winds, all the week, but "A" pilots and soloists have managed to get up during the lulls. If this is the beginning of summer, we are hoping that for the sake of flying winter will soon be here.

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending June 16.

Flying Time 9 hr. 30 min. *Instruction* 2 hr. 40 min. *"A" and "B" Pilots* 10 min. *Soloists* 2 hr. 10 min. *Passenger Flights* 4 hr. 5 min. *Tests* 15 min. *Instruction.—With Mr. Lowdell*—Dr. Mildred Yate, Miss Rhodes, Messrs. Porritt, B. F. Marriage, G. Smith, Verney, Billinton, Wedd, and Goodwin. *Soloists (under instruction).*—Messrs. Hanson, G. Smith, Verney, Billinton. *Passengers.—With Mr. Lowdell*—1. *With Mr. Prentice.*—1.

Bad weather combined with the fact that our machine did not return from Birmingham (where Mr. Lowdell was equal first in the Balloon Bursting) has resulted in a reduction of our activities during the week.

The only notable event was that on Saturday evening Mr. Verney successfully completed his height test for his "A" Licence, which he carried out in a very masterly manner.

Two machines are now serviceable and given fine weather we hope to obtain quite a bunch of "A" Licences during the next few weeks.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending June 16.

Flying Time 21 hr. 55 min. *Instruction* 5 hr. 45 min. *Soloists (under instruction)* 2 hr. 35 min. *Passengers.—Six Flights*—2 hr. *Instruction.—With Mr. Bartlett*—Messrs. Greenhill, Amory, Peters, Thomas, Lynas, Allison, Byrnes, Keeling, Lysaght, Girdlestone, Hughes, Godfrey, Jellicoe, Button.

By the end of next week we hope to have our new slotted Moth and we trust that all our pilot members will come and try it. Strong gales have again interfered with flying on most days.

The Cinque Ports Flying Club.

[Hon. Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

Report for week ending June 16.

Flying Time 16 hr. 10 min. *Instruction.—With Major Clarke*—Miss Allen, Messrs. R. Dallas Brett, Douglas, West, Capt. Took, Messrs. Pakenham, Braddell, Story, Burren, Miss Taggart. *Joy-rides.—With Major Clarke*—7. *Soloists.*—Messrs. K. Edgson Wright, R. Dallas Brett, Story, Douglas.

On Wednesday Mr. Douglas, of the Guards' Depot, Canterbury, did a successful first solo after 6½ hours' dual, and made a perfect landing. This is the third *ab initio* pupil to be launched in three weeks' working and we expect to launch two more this week.

There is still a vacancy for additional members, and the Club is in need of further capital to buy a second machine. Full particulars may be obtained from the Secretary, 114, High Street, Hythe, Kent.

This report does not include June 10, which was taken in last week's report, and, as usual, there was no flying on Tuesday.

A Brazilian Flying Club.

With the support and active participation of Señor Juvenal Lamartine, President of the State of Rio Grande del Norte, Brazil, the Aero Club of Rio Grande was founded in the beginning of this year.

At a meeting held in Natal, capital of the State, convened by Señor Lamartine, promises of adequate support for the proposed venture were given by representatives of the local leaders of society and commerce, and an aerodrome has since been acquired, and equipped with a shed. A club-house and a set of tennis courts are to be arranged on the ground.

Three machines—two Blackburn Bluebirds with interchangeable float and wheel undercarriages, and one Curtiss M.F. three-seater flying-boat—are to be acquired.

On the representations of Señor Lamartine a number of the municipalities of other towns in the State of Rio Grande have undertaken to prepare landing-grounds and it is expected that by the end of this year practically every town in the State will have an aerodrome ready for use.

FLYING SCHOOLS.

The Henderson Flying School.

[Managing Director: Lt.-Col. G. L. P. Henderson, Brooklands Aerodrome, Byfleet.]

Report for week ending June 14.

Flying Time 25 hr. 35 min. *Instruction.—With Lt.-Col. G. L. P. Henderson*—Miss MacDonald, Dr. Forsyth, Mr. Brooks. *With Mr. H. D. Davis*—Messrs. Bellamy, Payne, Oldmeadow, Oliver, Saunders, Norbury, Murray-Philipson, Jillard. *With Mr. W. F. Davenport*—Messrs. Matos, Knox. *Soloists.*—Messrs. Carlos, Crabtree, Oliver, Murray-Philipson, Allen.

Several pupils are almost ready for solo and five new ones have arrived.

Two hundred passengers were carried during the week.

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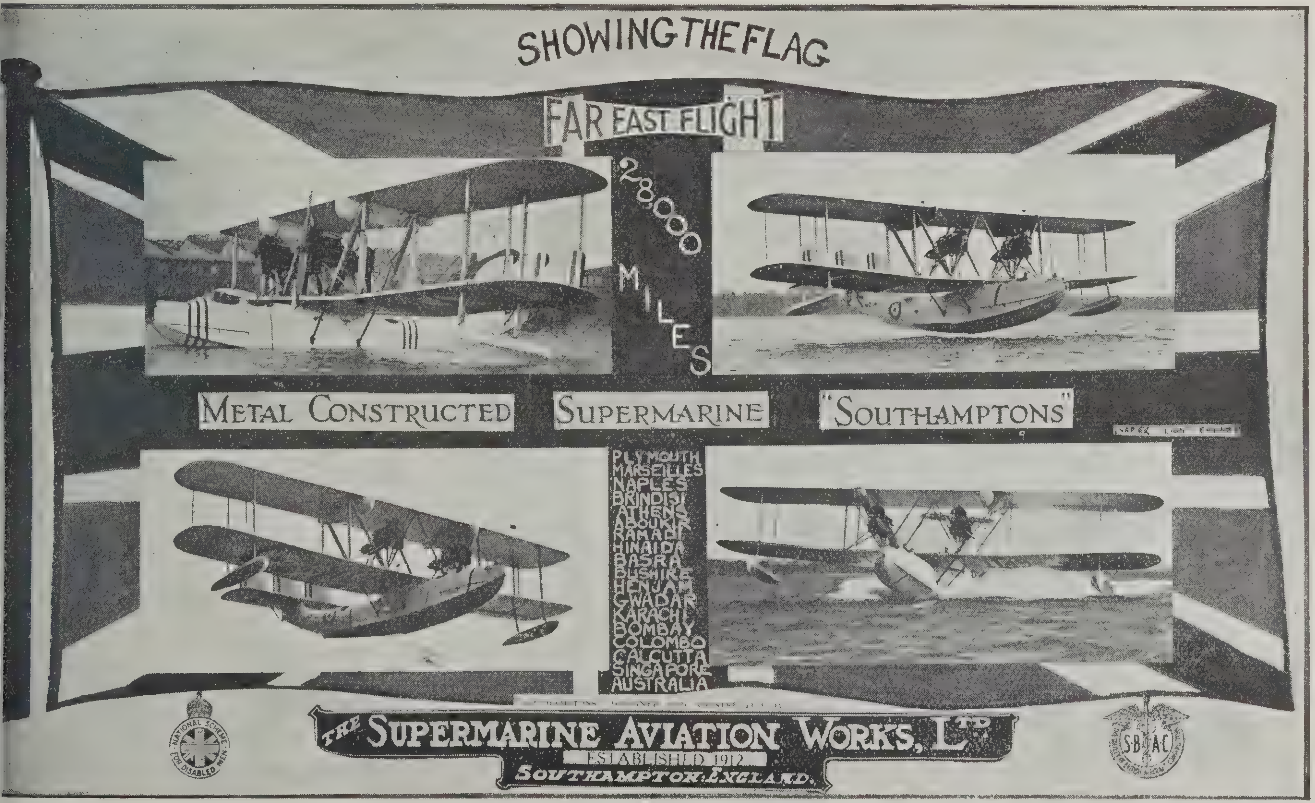

COMMERCIAL AERONAUTICS.

The London Terminal Aerodrome.

ANALYSIS OF FIGURES FOR THE PAST WEEK.

Trips per Day.—Sunday, 10; Monday, 30; Tuesday, 28; Wednesday, 29; Thursday, 28; Friday, 31; Saturday, 38.

Imperial Airways Ltd. :
London—Paris—Zurich; London—Ostend—Brussels—Cologne and return : Machines 80, passengers 625, freight 18 tons.

Air Union :
Paris—London and return : Machines 43, passengers 196, freight 15 tons.

K.L.M. :
Amsterdam—Rotterdam—London and return : Machines 26, passengers 136, freight 6½ tons.

Sabena :
Brussels—London and return : Machines 14, passengers 44, freight 1½ tons.

Deutsche Lufthansa AG. :
Amsterdam—London and return : Machines 22, passengers 40.

Private :
Machines 9, passengers 13.

Total number of trips by British Machines, 87, carrying 638 passengers. Foreign Machines, 107, carrying 341 passengers.

COMPARATIVE FIGURES.

Week ending June 16 :
Machines 194, Passengers 979, Crews, 367, Total personnel, 1,346.

Corresponding week, 1927 :
Machines, 143; Passengers, 1,015; Crews, 234; Total personnel, 1,249.

Corresponding week, 1926 :
Machines, 140; Passengers, 794; Crews, 178; Total personnel, 972.

Corresponding week, 1925 :
Machines, 162; Passengers, 718; Crews, 206; Total personnel, 918.

Corresponding week, 1924 :
Machines, 145; Passengers, 467; Crews, 179; Total personnel, 646.

Corresponding week, 1923 :
Machines, 120; Passengers, 441; Crews, 194; Total personnel, 635.

Corresponding week, 1922 :
Machines, 135; Passengers, 272; Crews, 193; Total personnel, 465.

Corresponding week, 1921 :
Machines, 105; Passengers, 381; Crews, 122; Total personnel, 503.

Corresponding week, 1920 :
Machines, 113; Passengers, 217; Crews, 122; Total personnel, 339.

Croydon Notes.

No one seems to know precisely what purpose was supposed to be served by the flight from Croydon to Turnhouse, near Edinburgh, by Imperial Airways Argosy, which, more or less, kept station with the L.N.E.R. Flying Scotsman, unless it were that the L.N.E.R. authorities do not believe that an aeroplane can make the journey in the same time as the train.

And as a matter of fact it did not in this case, as the party from the aeroplane reached Waverley Station a minute or two later than the train, having wasted a good deal of time circling round the wrong train near Berwick, and having also made a considerable detour and stopped twice for fuel. The aeroplane's time in the air for a total distance of 470 miles—against fairly strong head-winds—was about 6¼ hours, which is, at any rate, a good deal better than any train is likely to equal for an equal distance.

The rumour that Mr. Jones, of Imperial Airways—who travelled in the train—would pilot the Flying Scotsman on the return journey, while Mr. Birkett, an ex-engine-driver of the L.N.E.R., who went up in the Argosy, was to bring the Argosy home, has, one is assured, no more truth in it than the report given in one of the soberest of London daily papers that Major H. G. Brackley has assumed the position of Air Superintendent of Imperial Railways.

Mr. Van Lear Black evidently takes an interest in the sporting side of flying as well as in the uses of air transport. Hearing that there was to be a *Rallye Aerienne* at Reims on Saturday, June 16, with prizes for the civil machines which arrived there after having carried the maximum number of passengers for the longest time on the journey, he decided to compete.

The K.L.M. Fokker F.VII H-NADR, which is now at his disposal, was therefore loaded up with much fuel and six passengers, and left Croydon for Reims in the small hours of Saturday morning. It was intended to go to Reims via Nürnberg, putting in some 10 hours in the air by the way. Up to date no news of the success or otherwise of this effort can be obtained.

Mr. Brown, of A. V. Roe and Co., delivered a single-seater Avian, with its front cockpit fitted with long-range fuel tanks, to the A.D.C. works on Saturday morning. This machine is intended for a rapid flight in long stages to one of our distant Dominions, but no details of the enterprise have as yet been allowed to leak out.

Considering Holland's reputation as a flower-growing country it is not surprising that a good deal of horticultural produce should be carried to Croydon in K.L.M. machines. It will, however, probably be news to many that a very fair proportion of the earliest strawberries which were on the English market three weeks or so back were of Dutch origin and travelled to England by air. Strawberries have now been succeeded by rosebuds, and these in their turn, it is alleged, will be succeeded by rose slips for grafting purposes.

As the cost of transport for such commodities sent over in reasonable quantities is only about 3d. to 4d. per lb., and the goods arrive quickly and in fresh condition there is obviously quite an opening here for business, and the K.L.M. seem to make good use of their opportunities in this respect. At any rate, they seem to keep their machines on the London service more uniformly well loaded than do most lines.

AIR TRAFFIC TO PERSIA.

On June 1 last the first British commercial aeroplane to visit Teheran left Baghdad for that city via Kermanshah. It may be assumed that one at least of the objects of this journey was to enable Mr. G. E. Woods-Humphery, the General Manager of Imperial Airways, to visit the Persian authorities in their home-town in connection with the negotiations for use of the Persian Gulf route to India. The machine used was the D.H.66 *City of Cairo.*

At or about this same time the first fare-paying passenger to travel by air from Paris to Teheran reached his destination. The route taken was via Berlin, Moscow and Baku, and the total flying time taken was 52½ hours.

A SUCCESSFUL TEAM.—The Association Football team of the Handley Page Sports Club, who were runners-up last season in the 1st Division of the N.W. London Football League. Mr. Handley Page is in the centre. Mr. W. P. Savage, Works Manager, is seen on his left and Mr. E. A. Easy, Secretary of the Company is on his right.

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On Saturday, June 2nd, the Italian Aviators, Commanders Ferrarin and Del Prete, flying a Savoia S64 aeroplane, fitted with a Fiat engine, completed an endurance flight of 57 Hours 37 Minutes, thus beating the previous World's record by over four hours.

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MAPS FOR PILOTS.

Edward Stanford Ltd., the famous map publishers, who have supplied the maps used on most of the famous flights made by British and certain other pilots, have recently issued a list of aeronautical publications which they can supply.

Naturally the most interesting are the special series of maps for aeronautical work. These maps are prepared cards 10 inches square, which is a convenient size for use in even the cockpit of a light aeroplane, and are fixed into covers by easily detachable hinged rings. Maps and covers are treated by the Lutra process, which makes them impervious to water, oil or petrol.

Courses may be marked on the maps thus treated with grease pencils which are provided for that purpose and after use may be rubbed off without leaving any trace on the map.

For flying over Great Britain Ordnance Survey maps on the quarter inch to the mile scale are provided, eyeletted along all four edges so that using the hinged rings they may be joined together to form either North, South or East-West strips.

Similar maps for the Continent of Europe are also available to cover almost any route likely to be desired, and special maps for any other part of the World can be provided at comparatively short notice.

Those who need maps for flying purposes will be well advised to try Stanfords before going elsewhere, for the firm know precisely what the pilot's needs are and has an extensive experience of satisfying these needs.

EARNED PROMOTION.

His numerous friends will be glad to hear that Mr. Fred Hewlett, who for a number of years has been station manager at Croydon Aerodrome for the Anglo-American Oil Co. Ltd., has been appointed Circuit Manager. His new appointment, which is a jump of several steps at once, will mean that he will be responsible, immediately under Mr. St. John Plevins (who is, so to speak, Director of Aviation in the Anglo-American Oil Co. Ltd.), for all Pratts spirit used in aviation.

Mr. Hewlett came into aviation under Mr. Basil Foster (now an actor), who in 1920 looked after the joint petrol interests on the aerodrome. Later he was appointed Station Manager and from the conscientious way in which he has carried out his duties it has been obvious that he would shortly earn promotion.—G. D.

ANOTHER EMIGRANT.

Those of the R.A.F. who knew Lionel S. Punnett, who served in the R.A.F. with a Short Service Commission and is now in the R.A.F. Reserve, will be interested to hear that he arrived in Canada on May 26 to take up duties as pilot with Fairchild Aviation Ltd., of Grand'Mere, Quebec.

MORTGAGES AND CHARGES.

Lancashire School of Aviation Ltd.—Debenture dated May 23, 1928, to secure £150, charged on the co.'s property, present and future, including uncalled capital. Holder: E. G. Clerk, 8, Beech Street, Lytham.

PERSONAL NOTICES.

Death.

DARNELL.—On June 15, as result of a motor accident, Major Nigel Gordon Darnell, late K.S.L.I. (late Wing Cdr., R.A.F.).

VICKERS.—On June 17, at Weybridge, of septic pneumonia, Oliver Henry Douglas Vickers, late R.A.F.

Marriages.

CHAMBERS—SUTTON.—On June 16, at St. Martin's-in-the-Fields, Trafalgar Square, W.C.2, Charles F. M. Chambers, D.F.C., to Mary Barbara, elder daughter of W. Lincolne Sutton, F.I.C., Eaton, Norwich.

COLE-HAMILTON—FOX.—The wedding of Sq. Ldr. John Beresford Cole-Hamilton, R.A.F., son of Mr. and Mrs. John Cole-Hamilton, of The Martyns, Salisbury, and Hilda Violet Leslie, younger daughter of Mr. and Mrs. C. Leslie Fox, of Rumwell Hall, Taunton, took place on June 12 at Bradford-on-Tone.

HAMMOND—SWETE.—On June 12, at St. Mary's Horsell, Woking, Flg. Off. Alfred Vavasour Hammond, R.A.F., Cairo, Egypt, eldest son of Rev. J. V. Hammond, Vicar of Holy Trinity, Ayr, and Mrs. Hammond, to Marjorie, second daughter of Mr. and Mrs. Gerald Swete, of "Dennington," The Ridgeway, Woking.

MACLEOD—WACE.—In Australia, Major Thomas Macleod, of the R.A.F. (retired), to Lady Aurea Wace, of 15, St. Leonard's Terrace, Chelsea.

WOODIN—BYGOTT.—The wedding of Mr. John Horton Woodin, R.A.F., and Joyce, widow of Cecil Bygott, took place quietly at Holy Trinity Church, Brompton, on June 12.

Births.

BURNLEY.—On June 14, at "Wytecot," The Parade, Epsom, to Margery (*née* Stoughton-Harris), wife of Flg. Off. D. C. Burnley, R.A.F.—a daughter.

GEORGE.—June 9, at Invergordon, Ross-shire, to Betty, the wife of Flt. Lt. Robert George—a son.

RUSSELL.—On June 15, at Cranwell, Margaret Ann, wife of Flt. Lt. H. B. Russell—a daughter.

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INCORPORATING AERONAUTICAL ENGINEERING

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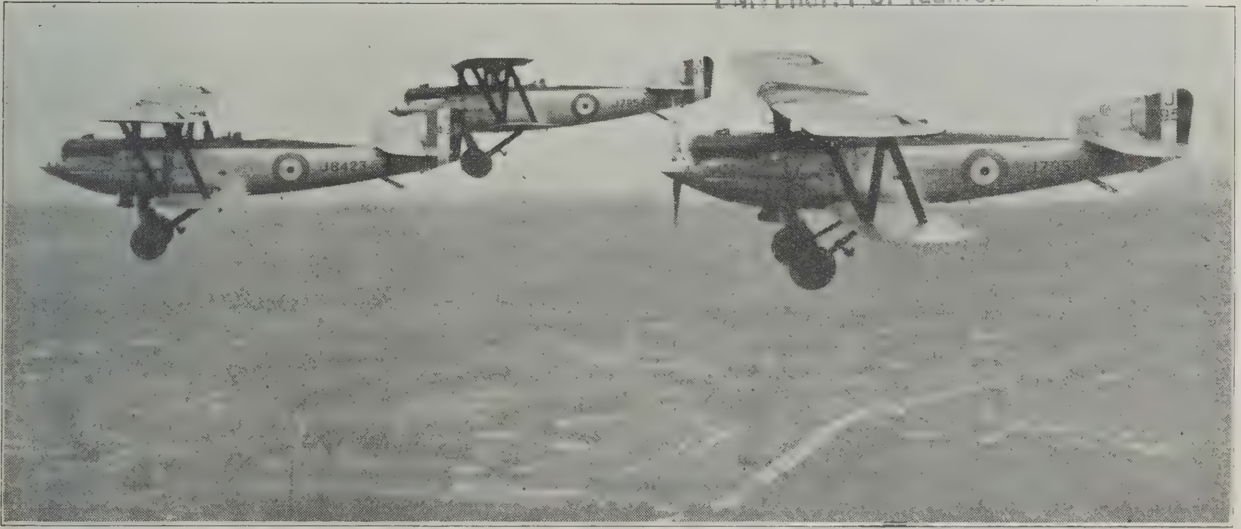

FORMATION:—A flight of Fairey Foxes (Curtiss D.XII engines) rehearsing for the R.A.F. Display which will take place at Hendon on June 30. The value of law and order is nowhere better seen than in the big formation manœuvres.

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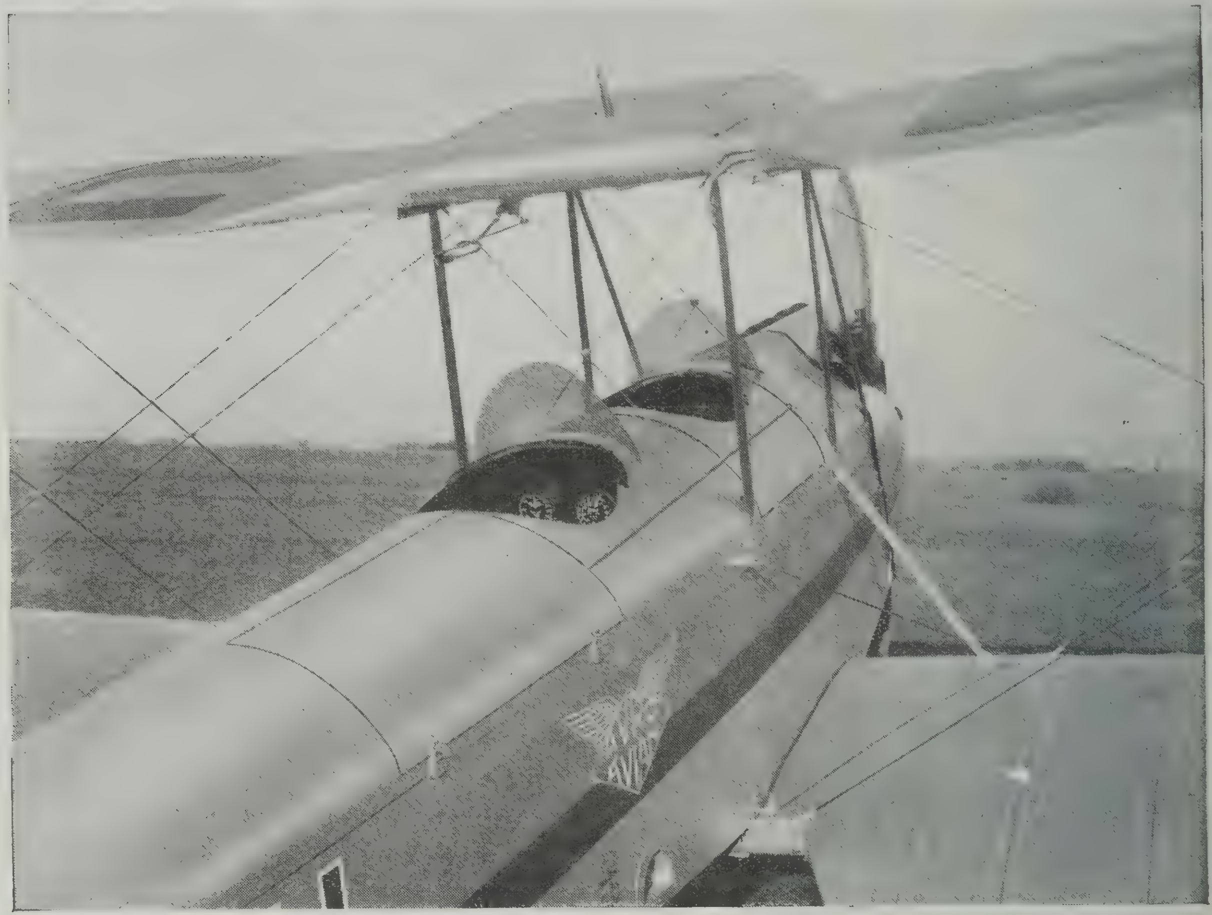

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JUNE 27, 1928.

THE AEROPLANE

Incorporating Aeronautical Engineering

VOL. XXXIV No. 26.

The Editorial Offices of "The Aeroplane" are at 175, Piccadilly, London, W.1.
Telegraphic Address: "Aileron, London." Telephone: Gerrard 5407.
Accounts, and all correspondence relating to Publishing and Advertising, should be sent to the Offices of Aeronautics, Ltd., 14, Bream's Buildings, E.C.4.
Telephone: Holborn 0426.
Subscription Rates, post free: Home 3 months, 7s. 6d.; 6 months, 15s.; 12 months 30s.
Abroad, 3 months, 8s. 9d.; 6 months, 17s. 6d.; 12 months, 35s. Canada, 1 Year, 8s.
U.S.A., 1 Year, $8.50c.

ON PRODUCING COMMERCIAL AIRCRAFT.

In last week's issue of THE AEROPLANE one set forth for the benefit of the commercially-minded readers of THE AEROPLANE, certain points as to what the World's Markets want in the way of aircraft and in the way of backing from manufacturers in the selling of those aircraft. Naturally all sorts of objections are raised to the arguments herein set forth.

Some manufacturers frankly disbelieve that there is any money to be made out of commercial aircraft. Others ask why they should waste time trying to build up a business in commercial machines when their factories are kept busy on making war machines either for this country or others?

Others again say that it is quite impossible in this country to turn out commercial aircraft at a price which can compete with the Americans. That, of course, is ridiculous. At the present moment, owing to the shortage in the United States of engines suitable for light aeroplanes, a Moth with a Cirrus engine can actually be imported in the States, pay $33\frac{1}{3}\%$ duty and then be sold at a lower price than an American-built machine of similar capacity. Consequently, in the British Dominions Overseas and in foreign countries, where we can compete on tariff terms with the United States, we can actually sell light aeroplanes cheaper than can the Americans.

Some of our manufacturers cannot get out of their heads the idea that because the Americans are experts in mass-production, everything made in America must be cheaper than everything made in England. As a matter of fact until any particular job becomes a mass-production job, anything made in America costs very much more than anything made in England. And aircraft are not yet in mass-production, even in the States, in spite of the fact that we are, by losing opportunities in the Overseas markets, doing our best to put the American manufacturer onto a mass-production basis.

THE COSTS QUESTION.

One of the quaintest arguments put forward against making a serious effort to capture the World's markets is that if firms started to turn out commercial aeroplanes at the price at which they could be built under ordinary industrial conditions (adding thereto, naturally, the additional cost of supervision of construction by the Aeronautical Inspection Department of the Air Ministry, and the cost of having the designs approved for a British Airworthiness Certificate by the Stress Department of the Air Ministry,—two of the most reasonable of Government Departments), the Contracts Department at the Air Ministry would want to know why there was such an enormous difference between the price of a commercial aeroplane sold abroad and the price of a war machine as delivered to the Royal Air Force.

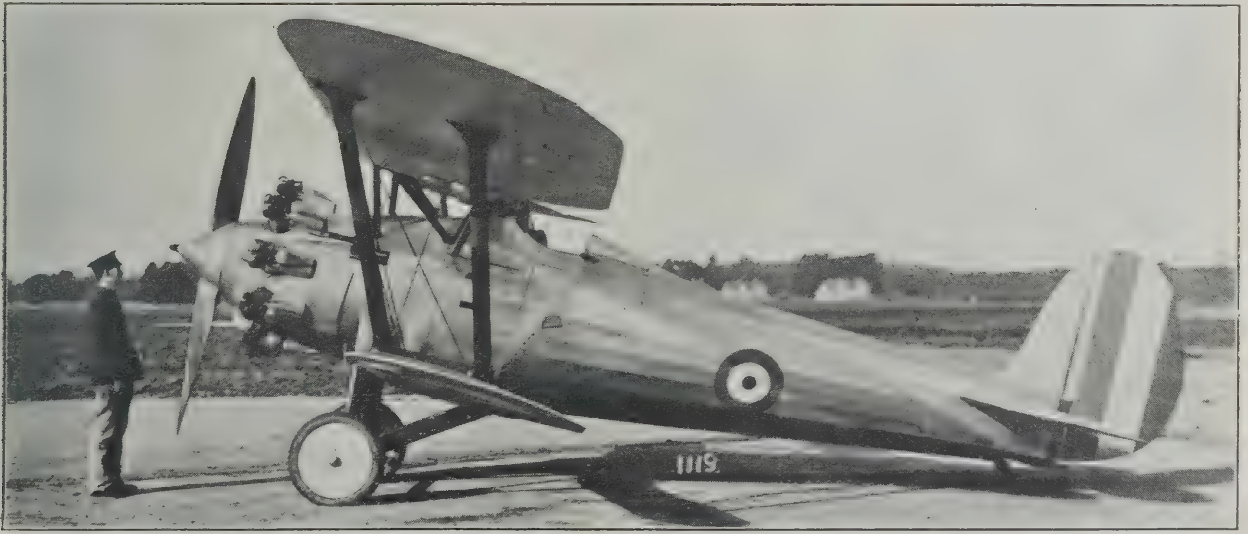
Apparently those who put forward this argument are afraid that if we started to make commercial aeroplanes on a commercial basis, the Air Ministry would insist on cutting the prices of war machines down to something like the same level.

The answer to this argument is, very simply, that when a manufacturer finds out what his markets want, he can lay himself out to make his machine just as any other factory-built goods are produced. He can run his factory in his own way. He can design his machines for cheap production, subject always to the approval of the Stress Department at the Air Ministry. He can use what material he chooses, and work on that material as he likes, subject to the approval of the material and the workmanship by the A.I.D. And so he can produce cheaply.

But, when he is building war machines he is in an entirely different position. In the first place, when a firm starts out to build a machine of a certain type for the Air Ministry, it has to produce experimental machines of that type. It may build one, it may build two or three. The designs of those machines have to be submitted over and over again to all the sub-departmental experts of the Air Ministry, each of whom wants something or another put into a different position, or made in some different way.

Then, when the designs have been approved and the machines are actually in process of construction, all those sub-departmental experts come along and insist on the machine being torn to pieces and stuck together again so that their various fittings and gadgets and so forth can be put in where they want them.

Guns have to be shifted to make room for wireless. Wireless has to be shifted again to make room for guns. Both have to be shifted again to make room for bomb gears. Bomb gears when fitted have to be altered to suit the fancy of the bomb expert. Somebody with ideas on petrol tanks wants the whole lot shifted to embody his particular notions. Then something else has to be shifted because the compass merchant wants his compass put where he would like it, even though the pilot may not be able to see it.



AN ENGINE OF WAR.—The Bristol Bulldog II, Jupiter engine,—a high-performance altitude fighter.—(R.A.F. Official.)

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

Alterations, corrections and re-corrections follow one another in an endless chain until the first experimental machines, instead of costing perhaps a couple of thousand pounds apiece, have probably run into £10,000, and by that time have been spoilt. A machine with precisely the same amount of material and factory workmanship in it could probably be built experimentally for £2,000 and turned out as a production job at perhaps £1,000,—that is, of course, without the cost of the engine.

All these thousands of pounds spent or wasted in complying with Air Ministry requirements, have to be spread over the cost of subsequent machines, if and when they are ordered and put into production.

Disjointed Output.

Moreover, a firm may produce half a dozen experimental machines of that kind, and they may be the whole output of the factory for perhaps a year or two, simply because the firm will probably have completed its last production order for the Air Ministry before the new type has been accepted and ordered in quantities. Consequently practically the whole factory may be standing idle for twelve months or even more, and all the overhead charges of that factory, design staff, rates and taxes, the specially highly-paid men in the experimental shops, and everything else, have to be charged onto the price of the Air Ministry machines. Even when the machines are put into production, the makers are not allowed to go ahead on them as if they were ordinary commercial aircraft. By the time they have been ordered, and production has begun, probably the sub-departmental experts have changed their minds about their own gadgets. The productions machines have to be altered to take some new type of bomb-gear or compass or wireless gadgets, so that masses of fittings which have been already made for the production machines have to be scrapped and new fittings or new parts made to accommodate the latest demands of the sub-departmental experts.

The result is that what with alterations in experimental machines, the overhead charges of big factories which are idle half their time, and alterations in the production machines, the actual cost of Royal Air Force machines on the factory floor is multiplied three or four times over compared with what would be the cost of ordinary commercial machines of the same engine-power and carrying-capacity, if produced in an ordinary commercial way in a commercial factory.

Naturally, if anybody starts out to build commercial machines in a factory which is also turning out war machines, those commercial machines have got to carry their share of all the dead charges and overhead charges and factory charges which have been put up by the methods which are inseparable from the production of material for Government Departments.

Cutting Down the Costs.

Consequently there is only one way of getting over all these difficulties and of making commercial machines on a commercial basis, and that is to build entirely separate factories.

If each firm which intends sooner or later to produce civil aircraft were to set up a cheap corrugated-iron workshop on the opposite side of its aerodrome from its main works (very much in the same way that the De Havilland Company started up in wood and iron huts at Stag Lane after the War), and if it were to equip this factory with just enough machinery, benches and so forth for immediate needs, and if it were to staff it with just as many competent hands as were actually needed, civil aircraft could be produced at genuine rock-bottom prices.

Such a factory would have to be registered as a limited company separate from the parent firm. Its rates and taxes and overhead charges would be practically nothing compared with those of the main factory.

Half a dozen competent draughtsmen could produce all the drawings necessary, under the supervision of the chief engineer or chief designer of the parent firm.

All the aerodynamic and aeronautical engineering knowledge necessary would already have been acquired by all this design staff at the expense of the parent firm. And all the regular business management would be done by the directors of the parent firm. Thus, apart from the actual reduction in workshop costs of labour and material, the subsidiary firm would cost nothing for the very things which in existing factories cost most.

Furthermore, its material could be bought along with the material for the parent firm and so would benefit by the lower price of large quantities. And its heavy machine work could be done by the parent firm at cost, without charging up any profit on it.

One Way and Another.

There are two ways of getting a cheap pair of shoes. One is to have them made by a little cobbler who sits in his front shop and does his own work in sight of his customers. The other way is to buy your shoes from a vast production factory in the Midlands. Either way you can get just as good a pair of shoes as you can for 50 per cent. higher price from small firms who try to make in fair quantities and keep up appearances with a handsome shop front.

To a great extent the subsidiary aircraft factory which one has advocated is in the position of the little cobbler. But it actually has behind it, free gratis and for nothing, all the knowledge and organisation of a vast firm which is maintained at the expense of the Government.

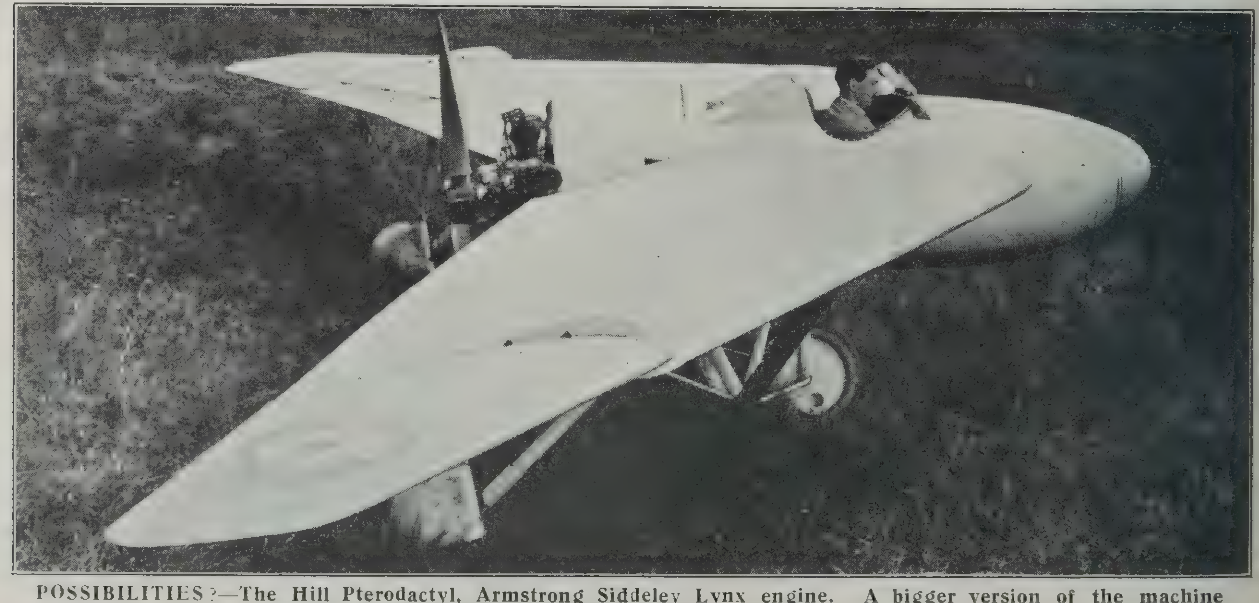
And in this there is no injustice to the British tax-payer. Whether the parent firm runs a subsidiary or not, the costs of the parent factory are going to be the same, and the enormous price which the Government has to pay for its aircraft of war is going to be just as high.

In this way one is certain that we can produce commercial aeroplanes at very much lower prices than we do at present. But, apart from that, one is equally convinced that the price could be cut down by specialising on designing for cheapness.

Designing for Cheapness.

One does not for a moment advocate cheapening production by cheap workmanship or cheap material. But one does believe that the cost of production can be reduced by making one piece of material do the work which at present is being done by two or half-a-dozen

Every designer of aircraft, whether for peace or war, ought



POSSIBILITIES?—The Hill Pterodactyl, Armstrong Siddeley Lynx engine. A bigger version of the machine seen at the R.A.F. Display two years ago. There seem to be possibilities in this type for the development of big flying-boats.

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

to have framed in front of his drawing board Mr. Bill Stout's famous motto, "Simplicate and add more lightness."

Simplicating, which is not at all the same thing as simplifying, not only adds more lightness, but it adds more cheapness in production.

There used to be a legend in the engineering shops that when a French locomotive engineer wanted to improve his engine he hung some new gadget outside it, but that when a British locomotive engineer wanted to improve his engine he cut something off it or out of it. There are very few aeroplanes in the World which could not be improved by this process of chopping off or chopping out things if a really skilful designer set about the job with that object in view.

So much depends on the point of view. The very same man who might produce a horribly complicated piece of design when told to produce a certain thing might be the very best man to chop chunks off somebody else's design when told to approach the problem from that angle.

Admittedly the very best designers are often their own most unkindly critics. But even they, if they look over again at a piece of design work which they have not seen for a few weeks or a few months can find ways of reducing the amount of work in it and consequently the cost.

FINANCIAL OUTLOOK.

One commends these suggestions to the financial rather than to the technical chiefs of the aircraft firms. There is enormous business to be done in commercial aircraft if only we will start in the right way to get it.

Genuine utility flights like that of Sir Alan Cobham round Africa and the regular flights of aerial survey firms in South Africa and in the Malay Straits area, are convincing Big Business that flying can help in making money. Even stunt flights half-way across the World and back, or across the Pacific or across the Atlantic, all help to make the people of the World airminded. And through that genuine aerial transport will arrive within the next few years.

Whether we get the business or whether America gets the business is purely a matter of which group of manufacturers has the sense to set about producing what the market wants and producing it at the lowest possible cost. If we do not get the markets, certainly nobody can blame THE AEROPLANE for it.—C. G. G.

THE BLACKPOOL AIR PAGEANT.

There is no doubt that after the R.A.F. Display at Hendon, the next biggest aerial affair in this country is going to be the Blackpool Air Pageant on July 6 and 7. Those air meetings which have taken place before in this country have been cramped by the fact that they could not get adequate support from the R.A.F. to make their meetings as attractive as they might be. The R.A.F. Display marks the climax of the R.A.F. training season. Before that date R.A.F. detachments are not available because they are still in training. After that date, being more or less the leave season, R.A.F. machines and personnel can be spared without interfering with the work of the Air Force.

Blackpool has been fortunate in securing the presence of between 75 and 80 machines of the R.A.F., which involves the attendance of some 350 R.A.F. officers and men. All the flying will be done by pilots and machines which have already appeared at the R.A.F. Display. And so the North-country people will have the opportunity of seeing for the first time the astonishing proficiency and efficiency of the Royal Air Force.

Although there is much to be said against Service personnel performing in public in association with civilian flying events, the need for making the people of this country airminded, and particularly the need for letting the British taxpayer see what he is getting for the money which is being spent on the Air Force, is certainly a good enough reason for putting up this show at Blackpool.

Moreover, the R.A.F. Display at Blackpool will be in a manner separate from everything else in that the civilian flying events will not be sandwiched in between the doings of the R.A.F.

Therefore, any readers of THE AEROPLANE who are unable to get to Hendon on June 30 should certainly journey to Blackpool on July 7.

There will be a great deal of flying on July 6, for the heats of the civilian races will be flown on that day. Fifty civil machines have been entered, so that there will be a large number of heats to get through. In addition to the usual array of Moths, Avians, Widgeons and Bluebirds, noteworthy competitors will be the Hawker Heron flown by Mr. Bulman, the Avro Avenger flown by Flt. Lt. S. N. Webster, the D.W.1 flown by Mr. Dudley Watt, the Beardmore Wee Bee flown by Sq. Ldr. Haig, the C.L.A.4 flown by Flt. Lt. Compers, the H.A.C.2 probably flown by Flt. Lt. Le Poer Trench, the Parnall Imp probably flown by Flt. Lt. Bonham Carter, and a modernised Austin Whippet flown by Mr. E. R. King.

The competitive events consist of four open races, (a) the Open Handicap; (b) the Blackpool Nomination Handicap; (c) *The Daily Dispatch* Nomination Handicap, and (d) a Balloon-Bursting Competition. There will be one race confined to owner Pilots. And there will be three inter-club events, (a) the Inter-Club Members Race; (b) the Inter-Club Relay Race, and (c) the Instructors' Aerobatics Contest.

The programme will begin at 10.30 hours on Friday. And in addition to the racing there will be displays by Sq. Ldr. Noakes and Messrs. Neville Stack, Hubert Broad and H. A. Brown on light aeroplanes, a display by Flt. Lt. Luxmoore on the Avro Avenger, two special displays of aerobatic flying by Herr Gerhard Fieseler (the German "outside looper"), and a parachute drop by a woman parachutist.

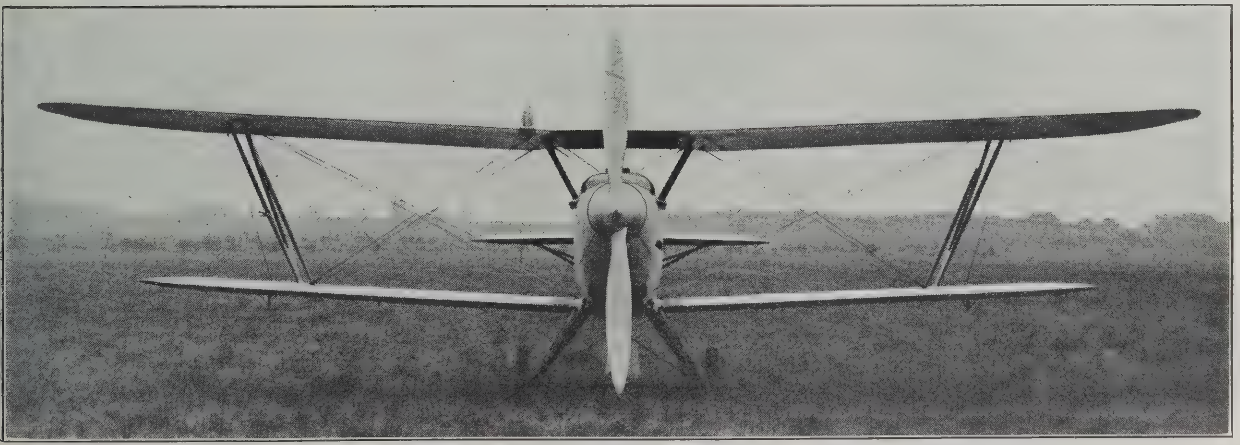
On Saturday the programme will begin at 10.00 hours. The R.A.F. Display will take up about two hours, somewhere about the middle of the afternoon. In addition there will be a display of upside-down flying by Mr. G. E. Lowdell, a parachute drop by Mr. Irvin (the inventor of the Irving parachute), displays of the advantages of the slotted wing by Sq. Ldr. Noakes and Sq. Ldr. England. And there will be the finals of the races, the heats of which will have been flown on the Friday.

Prices of admission will be as follows :—Special enclosure in the grand stand, £1 1s.; ordinary grand stand enclosure, 6s.; stand enclosure, 3s.; popular enclosure (no seating accommodation), 1s. Car parks are available for each enclosure at an extra charge of 5s. per car. Altogether enclosures are provided for 8,000 cars and about 90,000 spectators. Advance tickets, including reserved spaces in the car parks, may be obtained from the Town Clerk, Town Hall, Blackpool, or from any of the usual ticket agencies at reduced prices.

THE EAST TO WEST ATLANTIC FLIGHT.

The Royal Aeronautical Society, the Royal Aero Club, the Society of British Aircraft Constructors, and the Air League of the British Empire will give a luncheon at the Savoy Hotel on Monday, July 2, at 13.15 hrs. to welcome Baron Von Hünefeld, Captain Hermann Koehl and Commandant James Fitzmaurice after their East to West flight across the Atlantic.

Tickets £1 1s. each, inclusive of wines, cigars, etc. Applications should be made direct to the Royal Aero Club, 3, Clifford Street. Members of the above societies may be accompanied by ladies.



A DAY BOMBER.—A Fairey Fox, fitted with a Rolls-Royce F.IX engine. About the fastest bomber in the World.

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

THE ROYAL AIR FORCE.

The London Gazette.

June 19.

General Duties Branch.—Plt. Off. R J. Stone is confirmed in rank and promoted to the rank of Flg. Off. (Jan. 13) (substituted for the notification in the *Gazette* of Mar. 6); Flt. Lt. C. McC. Vincent, D.F.C., is placed on the half-pay list, Scale B (Mar. 29 to Mar. 31 inclusive) (substituted for the notification in the *Gazette* of Feb. 14)

The following cease to be attached to the R.A.F. on return to Naval duty (June 16):—Lt. the Hon. J. M Southwell, R.N., Flg. Off., R.A.F.; Lt. R. G. Poole, R.N., Flg. Off., R.A.F. Mate S. R. H. Davenport, R.N., Flg. Off., R.A.F., relinquishes his temp. comn. on return to Naval duty (June 4); Flg. Off. R. R. Money is transferred to the Reserve, Class A (June 14). The S.S. comn. of Plt. Off. on probation H. R. R. Ackerley is terminated on cessation of duty (June 6).

Accountant Branch.—The following are granted perm. comns. as Plt. Offs. on probation with effect from and with seniority of June 11:—M. L. Jones, H. A. Frost, T. C. Reep, C. V. Mears, R. Trippett.

Reserve of Air Force Officers.—General Duties Branch.—E. W. Mackay is granted a comn. in Class A.A. (ii) as Plt. Off. on probation (June 7).

The following Plt. Offs. on probation are confirmed in rank (June 13):—R. Anderson, J. M. Greenwood, J. A. C. Northway. Plt. Off. T. Herbert is transferred from Class BB to Class C (June 8).

Auxiliary Air Force.—General Duties Branch.—The following to be Plt. Offs.:—No. 600 City of London (Bombing) Sqdn.—D. B. H Coates (May 9); G. C. Bonner (June 1). No. 602 City of Glasgow (Bombing) Sqdn.—A. H. C. Gibson (May 21).

Appointments.

Week ending June 25.

General Duties Branch.—Wing Commanders A. T. Whitelock, to R.A.F. Depot, Uxbridge, for administrative duties, 18/6. E. R. L. Corballis, D.S.O., O.B.E., to No. 23 Group H.Q., Grantham, for Air Staff duties, 15/6.

Flight Lieutenant N. H. Jenkins, O.B.E., D.F.C., D.S.M., to No. 22 Sqdn., Martlesham Heath, 1/6.

Flying Officers J. St. C. Arbuthnott, to No. 39 Sqdn., Bircham Newton, 14/6. A. W. Elias, to Home Aircraft Depot, Henlow, 18/6. A. P. Bett, to H.Q., Wessex Bombing Area, Andover, 1/8. H. W. Taylor, to No. 3 Sqdn., Upavon, instead of to A. and G. School, Eastchurch, 11/6. J. V. Yonge, to A. and G. School, Eastchurch, instead of to No. 3 Sqdn., Upavon, 11/6.

Pilot Officers J. F. Griffiths, to No. 28 Sqdn., India, 25/5. A. R. Combe, to No. 45 Sqdn., Middle East, 3/6. G. E. E. Singleton, to No. 45 Sqdn., Middle East, 10/6. L. M. Woolveridge, to No. 216 Sqdn., Middle East, 3/6.

Medical Branch.—Wing Commander H. W. Scott, M.B., B.A., to R.A.F. Depot, Uxbridge, 2/7.

Squadron Leaders R. W. Ryan, M.B., to Central Medical Establishment, 12/7. J. T. T. Forbes, to No. 3 F.T.S., Grantham, 9/7.

Flight Lieutenant L. P. McCullagh, M.B., to R.A.F. M.T. Depot, Shrewsbury, 28/6.

Flying Officers J. M. Ritchie, M.B., to H.Q., A.D.G.B., Uxbridge, 16/7. V. V. Brown, to R.A.F. Station, Tangmere, 25/6. J. J. MacAndrews, M.B., to H.Q., A.D.G.B., Uxbridge, 2/7.

Stores Branch.—Flying Officers R. H. Clay, to H.Q., 'Iraq Command, 22/5. A. M. Reidy, to No. 2 Stores Depot, Altrincham, 14/6.

Accountant Branch.—Pilot Officers H. A. Frost, M. L. Jones, C. V. Mears, T. C. Reep and R. Trippett, to H.Q., Cranwell, on appointment to Perm. Comns., 11/6.

Fatal Accidents.

The Air Ministry regrets to announce that as the result of an accident at Wei-hai-wei to a Flycatcher machine of No. 403 (Fleet Fighter) Flight, H.M.S. *Hermes*, on June 20, Lieut. Raymond Arthur Aldridge, R.N., Flg. Off., R.A.F., the pilot and sole occupant of the aircraft, was killed.

The Air Ministry regrets to announce that as the result of an accident off Malta to a Dart machine of No. 463 (Fleet Torpedo) Flight, H.M.S. *Courageous*, on June 25, Lieut. John Nicholson, R.N., Flg. Off., R.A.F., the pilot and sole occupant of the aircraft was killed.

The Daily Telegraph correspondent at Malta states:—

While a flight of aeroplanes was taking off from the *Courageous* to-day a fatal accident occurred. The starboard wing-tip of the third machine, a Dart, fouled something on the deck of the cruiser, causing the machine to tilt and crash overboard.

The destroyer *Vimiera* immediately recovered the machine and brought it alongside the *Courageous*, but the pilot, Lieut. John Nicholson, R.N., was taken out of the cockpit showing no signs of life, and the application of artificial respiration for a whole hour proved of no avail.

The Reserve of Air Force Officers.

The Air Ministry announces that fifteen vacancies are available for candidates for training as pilots in the Air Force Reserve.

No previous flying experience is necessary but applicants must be between the ages of 18 and 25 and of good education and physique. After interview and medical examination selected candidates are nominated to commissions as Pilot Officers on probation and, subject to satisfactory reports, are confirmed in rank after 12 months. Promotion to Flying Officer normally takes place after 18 months' service.

Commissions are granted in the first place for 5 years, but at the end of this period extension may be allowed at the discretion of the Air Council for further periods each of not more than 5 years.

Flying training is carried out at civil flying schools at Edgware and Bristol and consists of a course not exceeding 3 months (preferably taken continuously) during the first 6 months of service, 6 hours' solo flying (within a maximum period of 10 days' training) during the second 6 months, and 12 hours' solo flying (within a maximum period of 20 days' training) in each subsequent year's service.

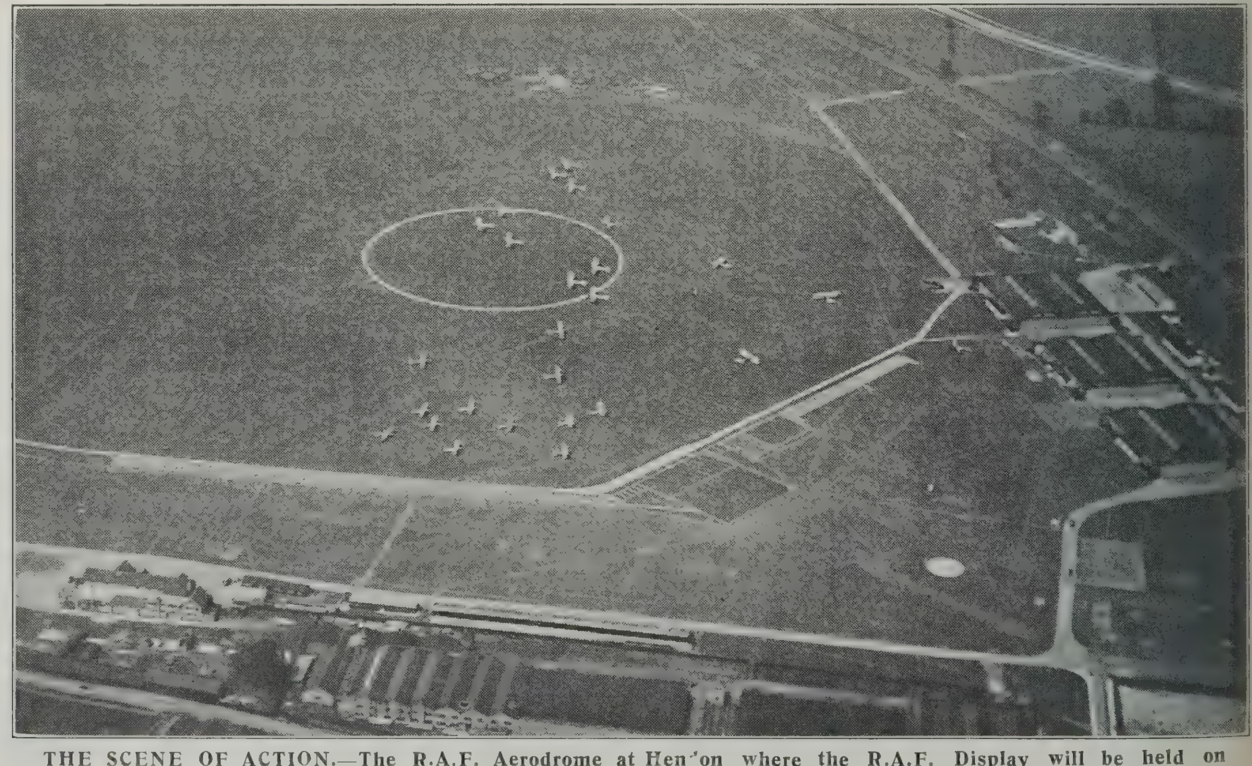
When undergoing training, an officer receives, generally speaking, the same pay and allowances as an officer of the same rank on the active list. In addition, an annual retaining fee of £30 is payable, subject to compliance with the regulations.

Application forms and further details can be obtained upon application to the Secretary (S.7.(c)), Air Ministry, Adastral House, Kingsway, London, W.C.2.

An R.A.F. Rescue.

The Times correspondent in Basrah in a message dated June 20 states:—

Passengers in a motor-car which was lost in the desert have been



THE SCENE OF ACTION.—The R.A.F. Aerodrome at Hendon where the R.A.F. Display will be held on June 30. The almost horizontal line in the top right-hand corner is a new road passing under the railway and linking up with the Watford and Barnet by-pass roads.—(" *Aeroplane* " *photograph.*)

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

The World's Greatest flying Spectacle!

All proceeds devoted to Air Force charities.

Tickets from usual Agents.

On June 30th at Hendon, from noon to 6 p.m., the Royal Air Force will hold their annual Display.

Among the many thrilling items will be—

Formation flying by three squadrons of aircraft, including a squadron of the latest type Fairey-Napier IIIF aircraft.

Demonstration with the latest British torpedo-carrying aeroplane —the Blackburn-Napier "Ripon."

A demonstration with squadrons of Vickers-Napier and Handley-Page-Napier twin-engined bombing machines.

Napier engines have recently flown from England to Australia—112,000 engine miles being covered without trouble.

There will also be on view the machine which won the Schneider Trophy for Great Britain —the Supermarine-Napier seaplane S.5.

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THE ANDOVER DISPLAY.—A corner of the machine park and some of the guests at the Display given at Andover on June 22 by the R.A.F.

> rescued through the prompt action of the Royal Air Force, which has once more proved how indispensable the aeroplane is in this country.
>
> The motor vehicle, which left Basrah for Nasiriyah on Saturday morning, with 21 passengers, including two women, failed to reach its destination. The police asked for the help of the Royal Air Force, which, after a two-days' search, found the vehicle in a remote spot in the desert, 100 miles off the track. The passengers were found 50 miles from the vehicle in a fainting condition. One youth had died through trying to slake his thirst with poisonous wild melon.

The Basrah Combined Hospital.

The Times of Mesopotamia of June 1 states :—

> The R.A.F. Combined Hospital at Makinah closes down to-day, and the matron and sisters will be leaving for Baghdad next week. I suppose in these days of economy gone wild there will be a certain saving of money. Let us hope a real hot Basrah summer will not come along, otherwise the "powers that be" may have to re-learn the lesson of 1915!
>
> It is said that R.A.F. patients are to be looked after in the Maude Hospital or flown to Baghdad.

The R.A.F. Units at and around Basrah served by the Combined Hospital are No. 84 (Bombing) Squadron, Shaibah, No. 1 Section, Armoured Car Wing, R.A.F., R.A.F. Base and Stores Depôt, Basrah, Marine Section, R.A.F., Basrah, and various minor stores and works detachments.

The Andover Display,

The Air Officer Commanding and the Officers of the R.A.F. Andover were "At Home" on June 22 to about 1,200 guests and entertained them to a miniature Display on the lines of the R.A.F. Display at Hendon. Preparations for the Display were severely hampered during the preceding week by bad weather. The day before and during the morning of the day itself the clouds over the aerodrome were at 100 ft. However the weather improved rapidly and became quite good.

The first event was the now familiar balloon-bursting battle. One pilot was in an Avro-Lynx and the other in a Bristol Fighter and the casualties among the balloons were high. The Avro pilot adopted the policy of waiting near the balloon-wagon and zooming up at his prey before it had time to get in the cross-currents higher up. The Bristol pilot hung round higher up and chased the escaped ones.

The second event was drill by a Wing of day-bombing Squadrons, which are doing this turn at the Display proper on June 30. The timing and formations at Andover were even better than at the rehearsals last week at Hendon. The Horsley Squadron retired to Netheravon without landing owing to lack of parking space at Andover.

The display of aerobatics by three Siskins of No. 41 Squadron which followed was excellent and quite justified Forty-one's claim to be *the* crack Squadron in the R.A.F. (Contradictory correspondence from other Squadrons will receive due consideration in the office of THE AEROPLANE.)

The next event was a converging bombing attack by five Grebes of No. 25 Squadron on a "Tank." That Tank had to be seen to be believed. It bore about the same relation to a real tank that the pink rat of four o'clock-in-the-morning does to an ordinary day-time-on-the-water-wagon-rat. But the converging and bombing were good and the tank blew up in excellent style.

Then three Horsleys from No. 100 Squadron went up with dummy parachutists under their wings and released them from about 500 ft. They hit the deck in the approved style as done by Senior Officers doing a pull-off drop.

Two Moths, one of the new "G" type and the other slotted, then performed the antics of intoxicated crabs.

This was followed by a demonstration by No. 12 Squadron's Foxes. This consists of diving past a given point at about 220 m.p.h., emitting fearful howls from the engines. This particular trick is very popular and is also said to create a feeling of great respect for the R.A.F. in the hearts of foreign potentates.

The Fly Past of different types included a Moth, Gamecock, Fox, Atlas, Avro (Training), IIIF, Bison, Dart, Horsley, Sidestrand, Hyderabad, Virginia, and finally "The Spirit of Wallop" a Hush-Hush machine of unprecedented beauty of line and variety of equipment. In case there were any spies or journalists lurking about, this machine did not leave the ground and divulge its performance.

The last event was an air battle. Andover was strongly defended by "powerful anti-aircraft guns" and No. 3 (Fighter) Squadron, and No. 17 (Fighter) Squadrons, from Upavon. The enemy were No. 11 (Bombing) Squadron and No. 99 (Bombing) Squadron. There was a great deal of noise from the guns, and, considering the species of guns, some miraculous puffs of smoke round the attacking machines. The Fighters attacked with much skill and after a lot of stannic-chloride casualties on both sides Andover was saved.

It was a delightful show and organised with real Service efficiency.—C. M. McA.

PROMOTION IN THE ROYAL AIR FORCE.

Two Air Ministry Weekly Orders have been issued recently dealing with the constitution of the General Duties Branch of the R.A.F., the introduction into this Branch of a new class of officers to be known as Medium Service Officers, and the retirement of senior officers who block promotion, and the appointment of Warrant Officers and civilians to do duties hitherto done by commissioned officers,—thus reducing the number of officers whose promotion is blocked.

The amendments in the constitution of the General Duties Branch laid down in these Orders are the result of an inquiry into the requirements in officers of that Branch, undertaken by direction of the Air Council.

The conclusions which have been reached as the result of this inquiry begin with a general survey of the problem. The official view states :—

> Disregarding personnel ancillary to the main functions of the Air Force, the main classes of personnel are :—(I) Officers for command, staff and administrative duties. (II) Officers for technical duties. (III) Personnel for junior flying duties. (IV) Skilled tradesmen.

After reviewing the system which has been in force since 1919 the Order states that certain broad facts have emerged. First that there has been a high percentage of posts of the rank of Flying Officer. Such of these as were flying posts could be filled either by permanent officers, by short-service officers or by airmen-pilots. The specialist posts, however, could be filled only by permanent officers; and the administrative posts, although they could be filled by short-service officers, could be so filled only at the expense of wasting expensive flying training.

Secondly it had appeared that specialist requirements could not be met even if every permanent officer were required to specialise, whether he desired or was suitable to do so or not. There were so few specialist posts above the rank of Flight Lieutenant that when specialist officers were promoted above that rank they could no longer be given specialist employment.

Thirdly it had appeared that the proportion of Flight Lieutenants to more senior posts was such that permanent officers would not be given an adequate career.

GOOD INTENTIONS.

The intention of the Air Council with regard to permanent officers is that every suitable Flying Officer shall be promoted to Flight Lieutenant, that nearly every suitable Flight Lieutenant shall be promoted to Squadron Leader, that the majority of Squadron Leaders shall be promoted to Wing Commanders and that the majority of Wing Commanders shall rise to Group Captain.

The Order points out that it would not be possible to maintain the desired number of promotions from Wing Commander to Group Captain if every Group Captain who was not promoted to Air Rank remained to the retiring age of his rank, and therefore in future a certain number of Group Captains, after holding one or more appointments in that

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

THE

ROYAL AIR FORCE
DISPLAY

at

HENDON

Saturday, June 30th
1928

There will be many Fairey Aircraft taking part in the Display including the "III.F" General Purpose and Fleet Air Arm types, the "Fox" day-bombing aircraft and the "Flycatcher" shipfighter.

rank, will be placed on half-pay annually with a view to retirement.

Two changes have been made in the ages of compulsory retirement. The age for Flight Lieutenants as for Squadron Leaders will be 45, but discretion will be retained to enforce retirement at the age of 40. The retiring age of Group Captains will be 53 instead of 55.

In considering the requirements of the Air Force in trained technical officers the Air Council consider that it is important to ensure that the proportion of permanent officers required to specialise is not in excess of the number of permanent officers fitted by ability and temperament to make good specialist officers. They have therefore decided to remove slightly over a fifth of the total existing specialist posts from the officer establishment and to allow Warrant Officers to be appointed,—or, in certain cases, civilians in lieu.

They consider that this change will provide a very necessary relief to the officer specialist establishment and will substantially improve the prospects of promotion to warrant rank of the airmen of the technical trades.

Up-Grading.

The second step which the Air Council have decided to take to meet specialist requirements is an up-grading of the remaining specialist establishment. [That is to say, posts will be considered as needing officers of higher rank than that of the officers at present holding such posts. In other words the status of the posts will be raised.]

The scale of this up-grading will be such as to allow of specialist officers spending the same proportion of their service in specialist employment in each rank up to and including Wing Commander.

The Air Council consider that as the result of these steps the number of permanent officers annually required to enter into specialist training will be about two-thirds of the annual flow of permanent officers.

With regard to administrative posts the Air Council have decided to reduce from commissioned rank rather over a fifth of the total administrative posts and to allow civilians or Warrant Officers in lieu. The Order states that it is considered uneconomical to employ officers who are fit for flying duties in administrative posts, except that permanent Flying Officers should pass a short period as adjutants on account of the valuable experience gained. [Valuable flying officers waste time in offices signing chits and memoranda and other documents, purely formally on behalf of the O/C Units, and such work could just as well be done by Warrant Officers who are not needed for flying.]

After removing these specialist and administrative posts from the officer establishment there would still be an excessive ratio of Flight Lieutenants' posts to posts above that rank which will be removed by the up-grading of non-specialist posts to Squadron Leader and Wing Commander.

Clearing The Middle Deck.

A large number of Flight Lieutenants' posts will be filled by the introduction of a new class of officers known as Medium Service Officers. These will be selected from short-service officers who on completing the five-year period of their engagement volunteer to serve for a second period of five years in Medium Service. On completing ten years' service in all they will pass to the Reserve for four years.

It has been decided to grant a gratuity of £1,000 to officers transferred to the Reserve after ten years' active-list service for the purpose of assisting the Medium Service officer in re-entering civil life.

About 20 to 25 Medium Service officers will be appointed each year.

In addition to retiring a number of Group Captains not required for Air Rank the Air Council have decided to up-grade to Group Captain a number of posts which appear to justify the appointment of an officer of that rank.

To ensure a more rapid flow through the rank of Air Commodore a proportion of Air Commodores who are not selected for promotion will be placed on half-pay with a view to retirement after holding one or more appointments as Air Commodore.

Medium Service.

More complete details of the conditions of service of Medium Service Officers are contained in a separate Weekly Order.

These officers will be eligible to attend short courses appropriate to their duties but will not be eligible for specialist, staff or language training.

Short Service officers whose active list service has been extended beyond seven years will not be eligible for Medium Service. A Medium Service officer, and any short-service officer, who may in future in exceptional circumstances be granted an extension of his short-service commission, will be finally ineligible for a permanent commission in the General Duties Branch. Such officers will however remain eligible for the grant of permanent commissions in the Stores Branch.

Medium Service Officers will be eligible for promotion but they will not be eligible for, or liable to be placed on, half pay.

Selections for Medium Service will be made by the Air Council under arrangements analogous to those for selections of short service officers for permanent commissions on the recommendations of A.O.C.s. In order to be recommended for Medium Service an officer must have completed three years' service on a short-service commission and be fit for full flying duties. In recommending officers for Medium Service A.O.C.s will have regard to their future suitability to perform flying duties in the rank of Flight Lieutenant.

THE TRAINING OF THE C.U.A.S.

The Cambridge University Air Squadron is a good show. There is no doubt about that. Anybody who has had to do with the organisation would be puzzled to say which is the keener, the Instructional staff or the actual people of the University who constitute the personnel of the Squadron.

Actually, the status of the Squadron is rather curious. It is not a squadron of the Royal Air Force and yet it provides a full-time job for a number of R.A.F. officers. There is a legend that a high Military authority who had to communicate with the Squadron, because co-operation was necessary between his Command and the personnel of the Squadron, wrote that he was puzzled as to the precise category in which the Squadron should be placed, and remarked that he supposed it was a kind of Motor Club. The wrath of the Squadron was distinctly subversive of discipline.

As a matter of fact, the status of the Squadron is as near as no matter that of a University Officers' Training Corps. Like the O.T.C. it provides a certain number of people who take permanent commissions in the Service and it provides Service training for a number of those who, though they intend to go into other professions, regard their training as a ground-work which would make them useful in time of war. There are altogether about thirty solo pilots in the Squadron, some of whom have put in over 100 flying hours.

The outlook of the members of the C.U.A.S. may be gauged from the fact that forty of them have already joined the R.A.F. Reserve. Several of the present members have been nominated for permanent commissions in the R.A.F. The Squadron certainly attracts the best type of University man, the sort who are sportsmen and students at once.

The C.U.A.S. was started in 1925 by the Air Ministry. And to the credit of the Authorities of the University it must be recorded that their assistance was given willingly. Things now are very different from what they were in the days before 1914, when three undergraduates named Vincent Nicholl, Maurice Wright, and F. G. T. Dawson tried to make Cambridge airminded. And one may add that a great deal of the credit for converting the Authorities to a sound outlook on Aviation must be given to Sir Geoffrey Butler, K.B.E.

At first the Squadron was concerned with experimental and research work. An excellent workshop and lecture room and headquarters were built on ground actually belonging to the Engineering Laboratory of the University. Thereafter arrangements were made by which members of the Squadron who were certified as medically fit by the Air Ministry doctors were allowed to fly during Term Time at the R.A.F. Station at Duxford. In this matter Cambridge gave a handsome lead to Oxford where, although efforts had been made to form a University Air Squadron, the Vice-Chancellor refused to take the responsibility of allowing men to fly during Term. At Oxford this objection has just been overcome.

The only expense to which a member of the Squadron is committed is an annual subcription of £2, which includes membership of the Cambridge University Aeronautical Society.

Though the Squadron does not pretend to advise its members on their future careers, and though it is not one of its functions to persuade members to become officers in the Royal Air Force, those who do choose to join the R.A.F. get very clear advantages out of having been members of the C.U.A.S. A member of the University who has passed for his degree and is under 23 years of age is eligible to be recommended by the University for a permanent commission in the R.A.F. Should he pass the various tests and be so appointed, this carries with it certain definite advantages.

If the candidate has an Honours Degree his appointment to the R.A.F. is ante-dated eighteen months, and if he has an ordinary degree it is ante-dated twelve months,—giving him that much extra seniority in the R.A.F. List. Also proficient candidates from the C.U.A.S. are given a shortened period of training in the R.A.F. before being appointed to a Service Squadron.

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

One day last week one had the pleasure of paying a visit to the Squadron in camp at the aerodrome at Old Sarum, which is normally the Headquarters of the School of Army Co-operation, and of No. 16 (Army Co-operation) Squadron.

The members of the C.U.A.S. use the Officers' Mess, but live in tents, which, apart from being healthy, provides certain innocent amusement. For example, if a member does happen to talk rather too much and interfere with the rest of the others of the community, it is always possible to extinguish his conversation by letting his tent down on him.

The Annual Attachment at Old Sarum is arranged so that the seventy-five flying members, which is the authorised strength of the Squadron, come down in three batches of twenty-five at a time for a fortnight each. The first detachment finished its fortnight last Saturday, and there was much lamentation over the fact that the weather stopped flying the whole of Thursday and half Friday. If these people had their way they would spend their whole time in the air. And as it is they average more than one hour a day.

Apart from actual flying training, which includes everything of which the individual is capable up to fighting-practice with a camera gun and artillery-spotting with a puff-target, the time on the ground is taken up with lectures on Air Force subjects and with visits to local Air Force units and certain Army formations such as the School of Artillery and the Armoured Force and so forth.

The puff-target is an interesting little toy. It consists of a table which can be transported to any part of the aerodrome, or of Salisbury Plain for that matter. From it electric wires are laid out to various positions within about a hundred yards of the table. A machine carrying a pupil under instruction flies over the table, which is taken as representing an enemy gun. The pupil signals by wireless from the machine to begin a shoot. The person in charge of the table presses a button and a charge at the end of one of the wires goes of with a bang and a puff of smoke. The pupil in the machine then signals to a ground station the position of that smoke puff in relation to the target, just as if it were a smoke-puff from a bursting shell from his own battery, and his corrections are compared with the position of each puff.

The puff-target provided one excellent lesson to a member of the C.U.A.S. while one was there. The G.O.C.-in-C. Southern Command, Sir A. A. Montgomery-Massingberd, happened to be inspecting the Station and the Squadron. The puff-target had been put on the edge of the aerodrome so that the General could look at it without a long walk and the puffs had been laid in longish grass between the aerodrome and the sheds. A long member of the C.U.A.S. happened to be strolling towards the sheds just while the officer in charge of the table let off one of the puffs, which exploded with a loud bang almost under the feet of the Cambridge man. He certainly beat his own high jump record in that moment.

Although the members of the C.U.A.S. in camp may not shun delights, they certainly live laborious days. They are split up into two flights, A and B. The following may be taken as typical of a day's work :—

At 07.30 hours A Flight has breakfast while B Flight gets the machines out of the sheds and starts up the engines. Exercise on an empty stomach being very hygienic, B Flight are probably the better men for the rest of that day. Next day B Flight has breakfast while A Flight swings props.

At 08.00 hours A Flight goes flying while B Flight has breakfast, and *vice versa* alternate days.

Taking the first day, to continue the example, at 08.40 members of B Flight go up for camera-gun practice in machines of No. 16 Squadron. At 10.30, A Flight does radio telephone practice in No. 16 Squadron's machines. A Flight pilots having landed, one hopes without crashing the machines, B Flight goes flying at 10.15. At 12.15 comes lunch, very welcome and much appreciated.

Here one really must remark on the unusual goodness of the Messing arrangements at Old Sarum. The rooms are tastefully and solidly furnished, and the food is excellent. It may be ill manners to comment on the fare provided by one's hosts. But really the Mess President and the Mess Caterer deserve to be congratulated.

At 13.15 A Flight go flying again and at 13.30 B Flight do radio practice. At 14.40 A Flight have some camera-gun practice. At 16.30 comes tea, and after that those who play games play them and those who don't don't. On the day that one was there, the first batch of the C.U.A.S. were finishing up a cricket match against the Station and won by about 4 runs, each side scoring just about 100.

One of the duties of the members of the Squadron when there is no flying is to clean down the machines. They were busy at it when one was there and they went about it with the enthusiasm of the true amateur who takes a genuine joy in getting thoroughly dirty for the pleasure of getting clean again. Lubricating oil in the hair is said to make it curl but petrol in the nose is distinctly unpleasant.

The machines themselves look very smart with their Cambridge blue band round the fuselage. And when the Bristol Fighters have their radiator-shutters shut one sees the arms of the University painted on them in a manner which is quite impressive at a distance though the expressions of the lions are quaint at close quarters.

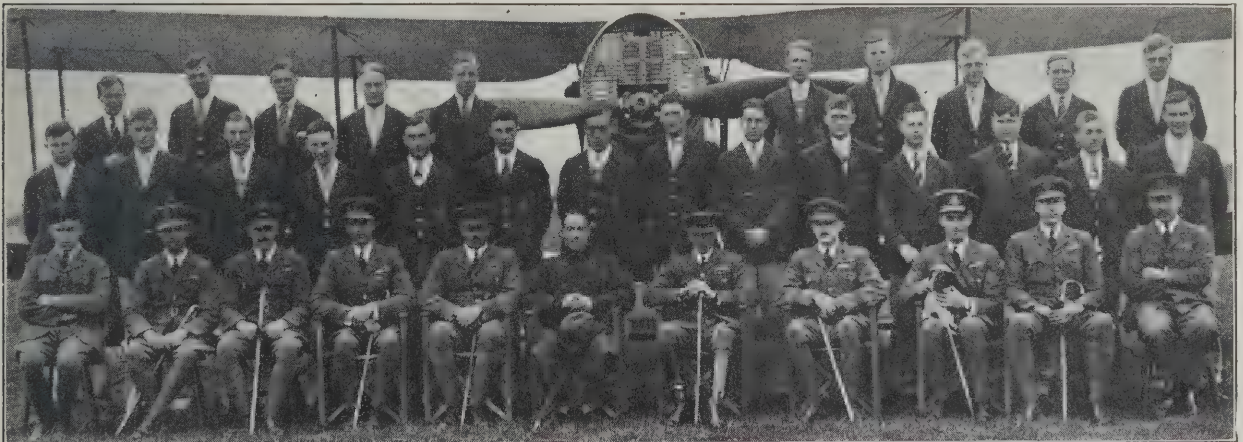
While at Cambridge the members of the Squadron benefit in one way or another from people who are important to the University. For example, Professor Melville Jones, who holds the Chair of Aeronautics, and his assistant, Mr. W. Farren of Armstrong-Whitworth Aircraft Ltd., do their best to raise the Squadron's knowledge of the pure and applied science of aeronautics. And Dr. MacCurdy of Corpus makes a study of the psychology of aviators, using the *corpus vile* of the Squadron for experimental purposes in his endeavour to discover whether the *mens sana* really exists in *corpre sano*.

One gathers that as in other branches of aeronautical science, practice frequently defeats theory.

The day before one was at Old Sarum. Sir Philip Sassoon, our excellent Under-Secretary of State for Air, arrived, as usual, in his pet Fairey III.F and in filthy weather. He inspected the Squadron with great care, thereafter dining with the Mess and staying the night on the station.

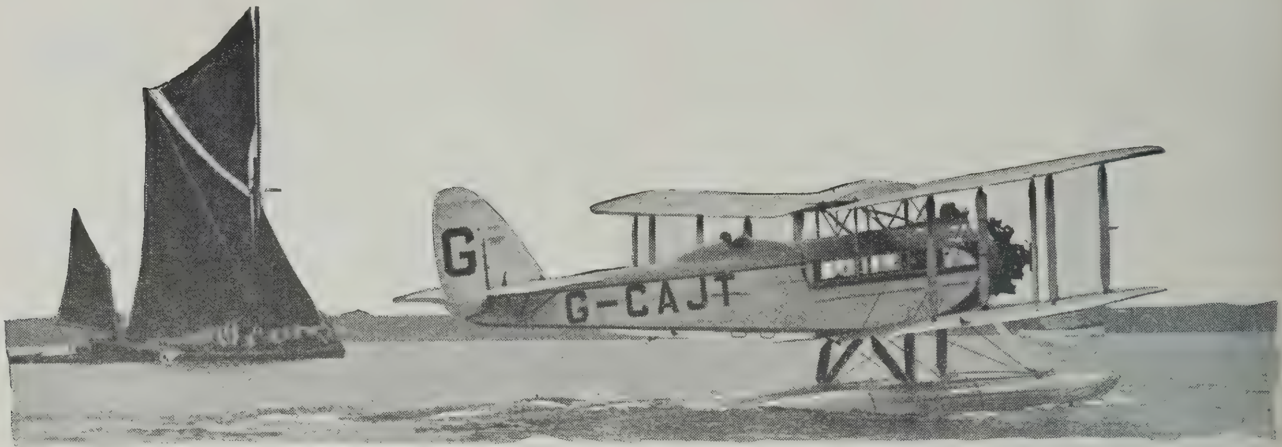
Sir Philip certainly does take a lively interest in all activities of the R.A.F., and one gathers that his questions to all and sundry are rather apt to shake those who regard such official people as politicians who have only a superficial knowledge of their subject.

Altogether, the Cambridge University Air Squadron is certainly one of the most potentially useful organisations concerned with aeronautics in this country. It is most efficiently run. And its spirit is such as to be worthy of the highest traditions of the Royal Air Force.—C. G. G.



THE CAMBRIDGE UNIVERSITY AIR SQUADRON.—The First Detachment at Old Sarum.—In the middle is Sir Philip Sassoon (Under-Secretary for Air). On his left is Wing Cdr. Vernon Brown (O.C., C.U.A.S.), next him is Flt. Lt. T. H. French, D.F.C. (Flying Instructor from Duxford), and next him Flg. Off. E. G. Hordern (also instructing at Duxford). On Sir Philip's right is Sq. Ldr. R. F. Leather, A.F.C. (Staff Duties), and next him is Flt. Lt. R. V. Goddard (Instructor, C.U.A.S.). Behind Sir Philip is Mr. R. C. Geddes (son of Sir Auckland Geddes), formerly Secretary and next President of the Cambridge University Aeronautical Society.

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.



. . . a sturdy, straightforward aircraft of high performance

now available as

LAND *or* SEAPLANE

THE D.H.61 "CANBERRA"

BRISTOL JUPITER XI

Engine (geared 2 to 1, commercial, 5 to 1, comp. ratio)

Without the extra cost and maintenance of multi engines, the D.H. 61 Land Machine and the D.H. 61 Seaplane give the highest possible performance, carrying six passengers in real comfort and a goodly quantity of luggage; when called for, eight passengers can be carried. The cabins of both machines are splendidly furnished and quiet to travel in, while communication between pilot and passengers is possible. As will be gleaned from the illustrations, the general layout is of an exceptionally clean nature and the construction throughout is robust and simple. The folding wings standard on both types of machines overcome many housing problems. Full particulars may be obtained from the DE HAVILLAND AIRCRAFT CO. LTD., STAG LANE AERODROME, EDGWARE, MIDDX

D.H. 61 WEIGHTS

	LAND PLANE	SEAPLANE
Tare Weight	3650 lbs	4050 lbs
Petrol, 80 gals.	616 ,,	616 ,,
Oil, 14 ,,	134 ,,	134 ,,
Pilot	170 ,,	170 ,,
Paying Load	2430 ,,	2030 ,,
Total wt. fully loaded	7000 lbs	7000 lbs

Note—For long range work the petrol capacity may be increased to 120 gals., the paying load being 2122 lbs for Land Plane and 1722 lbs for Seaplane.

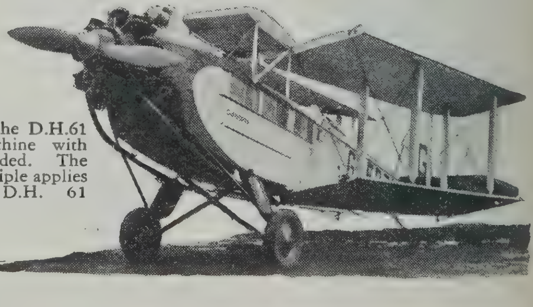
D.H. 61 PERFORMANCES

Speed at Ground Level	132 m.p.h.
,, 5000 feet	127 ,,
,, 10000 ,,	120 ,,
Climb to 5000 ,,	6½ mins
,, 10000 ,,	16½ ,,
Rate of Climb at Ground Level	900 ft/min
,, ,, 10000 feet	400 ,,
Service Ceiling	16000 feet
Absolute ,,	18000 ,,
Range with 80 gal. tank	450 miles
,, 120 ,,	675 ,,

These tests were carried out with an all-up weight of 6230 lbs, paying load on this weight equals 1260 lbs for Seaplane and 1660 for Land Plane. The engine was completely uncowled and it is probable that speed figures will be materially increased.

Streets

Showing the D.H.61 Land machine with wings folded. The same principle applies to the D.H. 61 Seaplane.



AERONAUTICAL ENGINEERING
SUPPLEMENT TO "THE AEROPLANE"

THE MECHANICAL PLOTTING OF AIR PHOTOGRAPHS.

The idea seems to be prevalent in some circles that the plotting of maps from aerial photographs is at best an approximate method of surveying, depending entirely for its accuracy on the skill of the pilot and photographer who take the original photographs.

This is scarcely a correct view, and it is well that it should be removed. It has been shown by experience that a skilled survey pilot can fly so accurately that simple methods of plotting, amounting nearly if not quite to treating the photographs as correct plan views, will produce maps of certain types of country of a very useful degree of accuracy. Therefore methods of plotting air surveys which are simple, cheap and quick, but to some extent limited in their accuracy have been widely used, more particularly in districts where no accurate surveys have hitherto been made, and where such surveys would be lengthy and costly businesses.

Aerial photographs are, however, capable of being used to produce maps whose accuracy is in no way dependent on the accuracy with which the survey pilot maintains level and straight flight. Accurate flying will always tend to make simpler the process of plotting to any given degree of accuracy and therefore remains an important factor in the cost of making such a survey, but the minor unavoidable changes in height and tilt of the aeroplane during a photographic flight need not interfere in the least with the accuracy of the resulting map.

To secure this result the camera is used not so much as a picture-making machine but as a recorder of angles, and the process of survey must become—as does the usual type of ground survey—one of fixing positions by means of intersecting angular bearings.

The first essential for the making of an accurate survey by ground methods is a base line of accurately known length and position. In civilised countries two points whose position has already been fixed may be selected as the end of this base line. Or it may be necessary to fix the ends of a base line on the spot, by astronomical or other available means.

Having "fixed" a base such as AB (Fig. 1) the surveyor measures the angle to the base line of the line of sight to a point removed from the base line C, from each end of the base. He then knows the angles ABC and CBA, and the length of his base AB, and can determine the exact position of C relative to AB by a simple geometrical construction or by trigonometrical calculation. This gives him the length and position of the lines AC and BC, and he can use either of these lines as a second base from which to determine the position of other points. Thus from B and C he may measure the angles CBD and DCB and fix the position of D. The process can obviously be extended indefinitely as to E and F.

This process involves only plane geometry—or plane trigonometry. But C may not be on the same level as AB. C may be the summit of a hill. The surveyor, however, can still measure the horizontal bearings of C from A and B which will give him the position of C_1, the projection of C on a level plane through AB—which is what he needs for plotting the position of C on his map.

If he needs to show on his map heights, or contours, he may determine the height of C by measuring the vertical angle C_1, AC or C_1, BC or he may measure the height directly by levelling, according to circumstances.

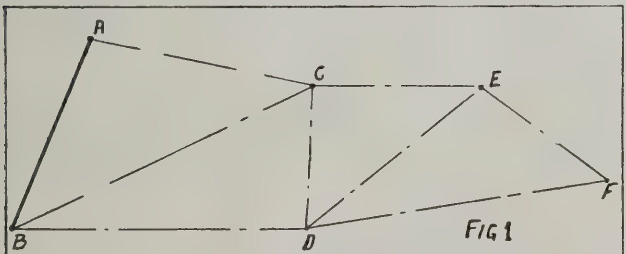


FIG 1

In such a survey the plotted position of the points CDEF depend for their accuracy on the accuracy with which all the angles have been measured and reproduced in plotting, and secondly on the accuracy of the length and position assumed for the base line.

If the length of the base line is incorrect the map will be incorrect in scale only. If the assumed position of the points A and B, that is the direction of the line AB is in error, the map will be displaced in consequence.

In either of these cases the map will be accurate in shape, that is, the position of all points relative to the base line will be shown correctly, if the angles are correct.

If ABCD, Fig. 2, represents an area on the ground covered by a photograph abcd taken by a lens at O it can be seen at once the angles AOB, AOC, BOD, etc., of the light rays from the lens to the corners of the ground area are exactly equal to the angles aOb, aOc, bOd, of the light rays from the lens to the corners of the photograph, apart from any distortion which may be caused by the lens itself.

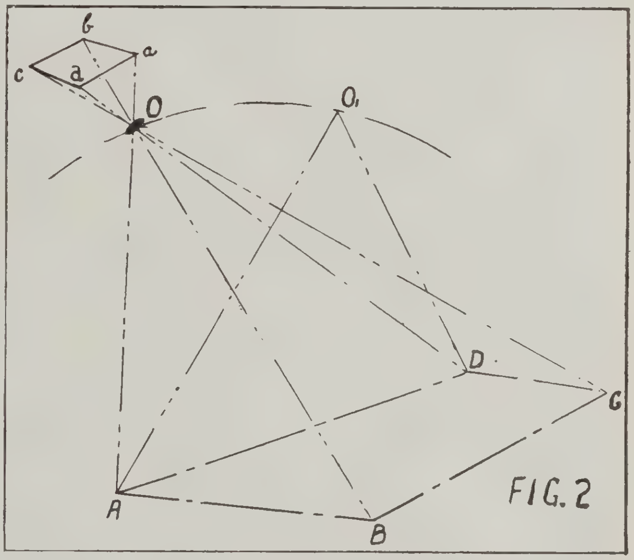


FIG. 2

It can at once be seen that this relation holds good for any points in the area ABCD. The angle subtended by any two points on the ground from the position of the lens is equal to the angle subtended by the image of these two points in the photograph from the position of the lens.

"Position of the lens" here means the position of the point in Fig. 2 where all the light rays cross. This position may be more accurately described as the optical centre of the lens, a point which in practice may be outside the lens itself but which is nevertheless a point definitely determinable.

From these considerations it is obvious that any photograph is a record of the angular bearing of every point shown in the photograph from the optical centre of the lens at the moment of taking the photograph. It is necessary only to know the exact "focal length" of the lens used and from the photograph one may determine the bearing from the position of taking the photograph of every point shown in that photograph.

Imagine that it is required to plot a map of the area ABCD from the photograph abcd. From the photograph it is possible to determine the angle aoc—equal to the angle AOC—which by itself does not help us much. Remembering the methods used in surface surveying it will be obvious that to get much further we need some sort of a fixed base from which to plot measured bearing angles. Elementary geometry tells us that to determine a triangle completely at least three of its characteristics require to be known, and it is clear that as we cannot accurately tell the position of the

DO NOT FORGET THE R.A.F. DISPLAY ON SATURDAY.

lens at the instant of taking the photograph we must look on the ground for our base.

The simplest " base " that will serve the present purpose is a knowledge of the precise position on the ground of three points, not in a straight line, shown in the photograph.

Suppose that we know the length of AC. There are an infinite number of different sized triangles which may have the angle aOc (or AOC) at their apex and the length AC as their base. Even if by some means we could determine which particular size corresponded to the correct triangle AOC the point O might lie anywhere in the arc of a circle whose centre lies on AC.

If however we know the correct position of a third point (say D) we can find one and only one position for O relative to ACCD which will account for the measureable values of the angles AOC, COD and the known positions of A, C, and D.

Therefore to use an aerial photograph for the purposes of rigidly accurate plotting it is necessary to fix a " base " consisting of at least three points on the ground area covered by the photograph. Then by measuring the angles subtended from the optical centre of the lens used of the images of these three points it becomes possible to fix the precise position from which the photograph was taken. When this position is known the plotting of a map becomes a matter of fairly simple geometry, providing always that the surface to be mapped is truly level.

Determining this position of the lens at the moment of the exposure may be accomplished by actual measurement of angles and by calculation therefrom. It can be done much more simply by making a sort of scale model of conditions at the moment of photography. Imagine that the photograph having been developed, it is printed as a lantern slide, put into a magic lantern of enormous power, which is taken into the air by the original aeroplane. This lantern uses a lens of the same focal length as was used in taking the photograph, and the image is projected earthwards. If the lantern is by this means brought so that the lens reaches exactly the position O of the camera lens at the moment of exposure, then the projected image of the lantern slide will fall on the surface of the earth so that the image of each point coincides with the point itself, and it is only from this point that such a result can be obtained.

If instead of this full-scale method, we plot on a piece of paper the position of our three " base " points A, C, and D to any convenient small scale, and can then find a position for our magic lantern such that the projected images of A, C, and D fall on the scale plottings of these points, the position of the lantern lens then represents to the same scale as the plotting of the three points the position of the camera lens at the moment of exposure.

As has already been said this is all that is needed to plot a map from this photograph if the surface photographed is truly level. The earth's surface usually is not truly level and this introduces a complication.

Suppose that in the middle of the flat plain ABCD there is a tower whose summit is E (Fig. 3). A photograph taken from O is projected onto a correctly plotted plan of A, C, and D in the manner suggested. The projected image of E will fall not at E_1, its correct position, but at E_2, a very marked error.

Nothing we can do will make the image of E fall on the correct position E_1, which will not cause the images of A, C, and D to fall out of place. But if by any means we can tell the height of E above ABCD, then having found the position for the lantern that squares with the known position of A, C, and D, we may raise our paper screen through the distance to which on the scale of the plotting corresponds to the real height of E and the image of E is then in its correct place on the plot.

Therefore to make an accurate map some method of finding the height of all the points it is desired to plot above the datum level of the triangular base ACD is necessary. A method of air survey which depends on ground measurement of height is obviously of limited use, therefore it is necessary to discover how to measure heights from the photographs. This fortunately is quite possible.

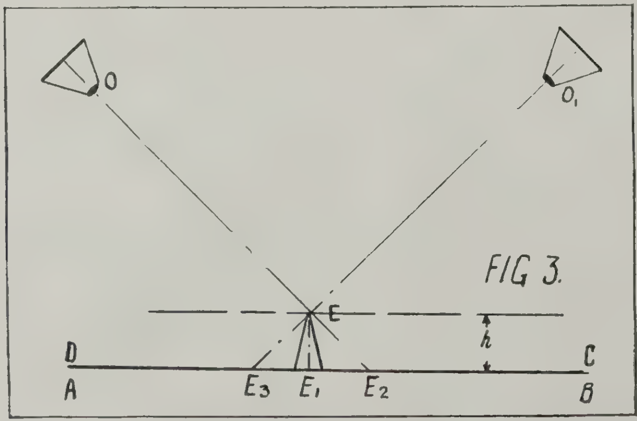


FIG 3.

If another photograph of the area ABCD taken from another position O_1 is taken, repeating the process of projection to scale already described will produce on the screen a second image which will coincide—for all points on the flat plain—with the first projection. The image of E however will fall in a new position E_3. But if the screen is again raised to the correct scale height " h " the two images of E will coincide, and in the correct scale position.

It can now be seen that to plot an accurate map by this method it is necessary firstly to fix on the ground by ordinary surface methods the position of three points. This fix must include the heights above some convenient datum of each of those points. Secondly it is necessary to take two aerial photographs from different positions, both of them showing all the three fixed points. The next step is to find the position from which the first photograph was taken. To do this plot to a convenient scale the positions of the three points on a flat screen. Then placing the screen at a height above any convenient datum which to scale represents the height of point A, manœuvre a magic lantern and a slide of the first photograph till the image of A falls on the plot of A. Now raise or lower the screen to the scale height of point B and manœuvre till the image and the plot of B coincides without disturbing the original coincidence of image and plot of A at their correct level. Having succeeded in this, move the screen to the correct height for point C, and repeat the performance.

In this way the correct position of the projecting lens has been found, and the image of every point falls in its correct scale position on the screen, when the screen is at the height corresponding to the real height of that point.

Now it becomes necessary to repeat the performance with a second magic lantern projecting the second photograph, the first lantern remaining undisturbed in the meantime until both images of each of the points A, B and C coincide with the plot when the screen is at correct height for each particular point.

When this has been achieved it will be found that there is one, and only one, height for the screen which will secure the coincidence of the two images of any other points shown in the photograph. This height of screen obviously represents to the scale of the plot the true height of the point, and the position on the screen of the coincident images is the correct scale position of that point on the map.

The method described would in practice be found unsatisfactory mainly because except in very flat country the dual images projected on to the screen would appear confused and blurred over all the areas whose level did not correspond with that of the screen at the instant.

By printing the two lantern slides one in green and one in red, and by using a red screen over one and a green screen over the other eye the method becomes more practicable. Over areas where the level does not vary greatly stereoscopic fusion of the dual image is secured, and accurate plotting is possible in those areas. By consecutively readjusting the screen level the whole area overlapped by the two images can be plotted and also contoured with quite good accuracy, and somewhat similar methods have been used with quite satisfactory results.

The logical development of this principle of plotting from aerial photographs is to be found in certain very ingenious plotting machines developed in Germany, and more particularly in the Autocartograph and the Aerocartograph developed by Dr. Hugershoff, and made by the Aerotopograph G.m.b.H. of Dresden.

In these instruments transparent positives of the photographs to be plotted are placed in projector lanterns, but instead of the image being projected as a whole onto a screen it is projected through a lens and reflector system to the eye of the operator carrying out the plotting. The lens of each projector—which corresponds accurately in optical qualities with the lens used to take the original photograph—together with the rest of the reflector and eye-piece system appended to it, forms a sort of telescope, and the observer is able to see through each eye-piece at any one time only a small area of the photograph.

The reflector system which, so to speak, looks into the projector lens is universally jointed, so that it may be pointed through this lens in any desired direction, and by this means the observer can examine any desired part of the photograph. The axes about which this reflector moves pass through the optical centre of the projector lens, and it will therefore be obvious that to move the centre of the field of vision in the telescope from the image of one point to that of another the reflector must be moved through an angle equal to the angle subtended by these images from the lens

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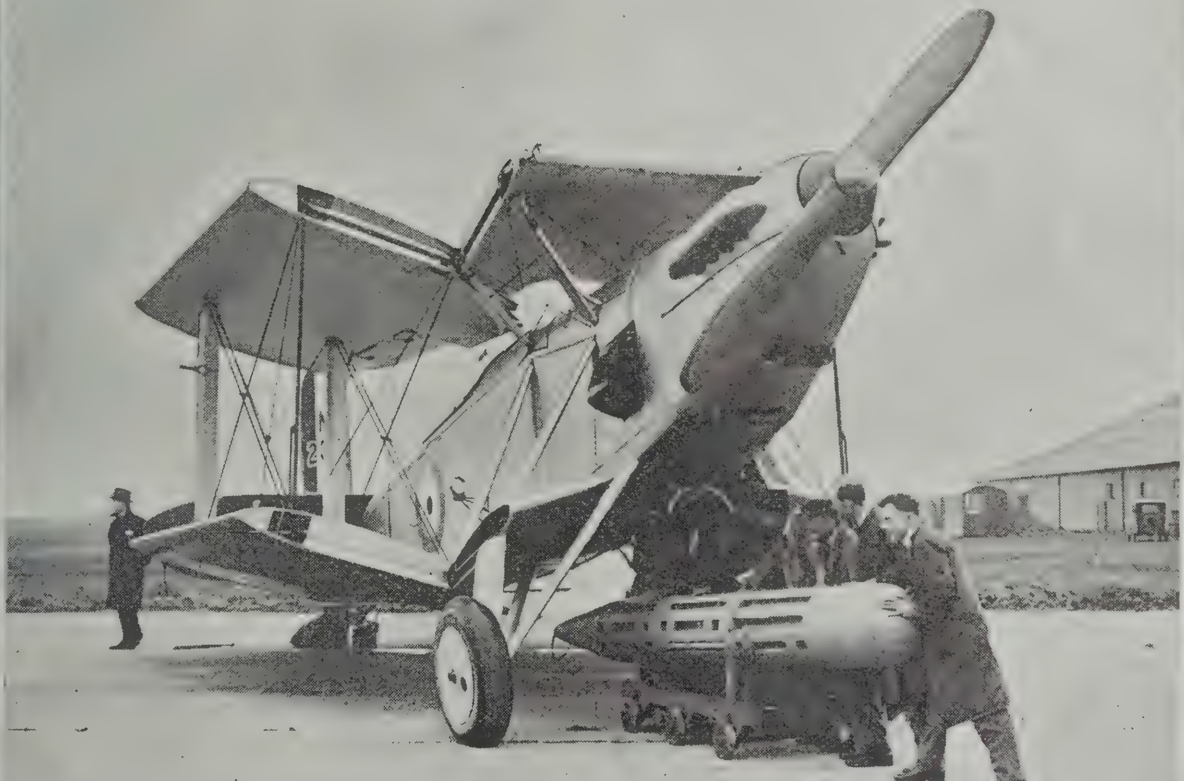
"The Aeroplane", May 23 1928.



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centre. This angle, as has already been shown, is equal to the angle subtended by the points on the earth which correspond to these images as seen from the position of the lens when the photograph was taken.

So far, therefore, the arrangement is a sort of theodolite which allows of the measurement of the angles subtended by any series of points at the position of the camera from the photograph instead of by direct observation. But the angles so measured are solid angles, and any attempt to calculate and fix position by means of solid trigonometry would at the best be laborious. This drawback can simply be avoided.

In Fig. 4 is shown the area ABCD and the camera which photographed this area in the case of Fig. 2, but this time instead of a perspective view the conditions are shown in true plan and true side elevation. It is obvious that this figure will also serve as a plan and elevation view of the magic lantern "scale model" arrangement suggested already when the lantern has been manœuvred into its proper position.

Now, if the telescopic system of the Hugershoff type of machine is imagined to be applied to the lens O in this case, and the movable reflector system is pointed to the image of point C say, it must in plan view be pointed along the continuation of the line CO in this plan.

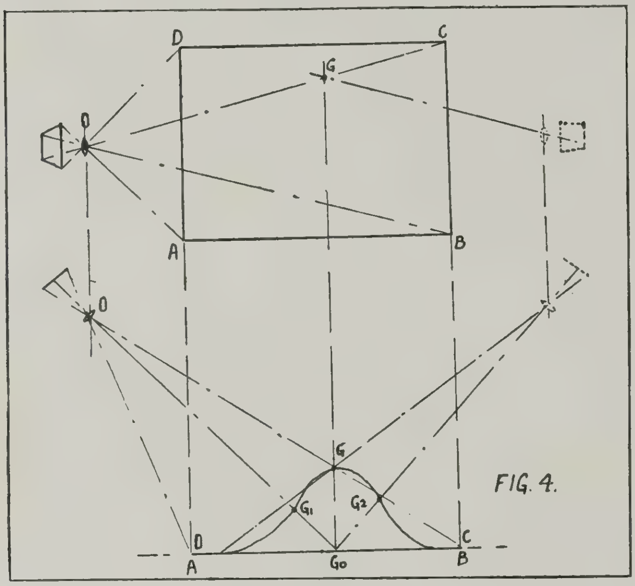

FIG. 4.

Suppose the reflector to be carried on a vertical axis passing through O, the lens centre, and that this axis takes the form of a rigid rod passing down to the level of the screen, and that a ruler is fixed to this rod, so that its ruling edge is in plan parallel to the "line of sight" of the reflector and lying on the screen. It is obvious that when the reflector is pointed to the image of C the ruler will point to the correct position of C on the screen.

More than this it will be seen that to point the reflector to the image of any point lying along the line OC in plan the ruler must also lie along this line and that when the ruler is in this position the reflector may point to the image of any point between C and O.

To get a definite "fix" for any such point something more must be known. Suppose that the reflector is actually pointed at the image of C—that is this image is seen on the cross-wire of the telescope. Then looking at the elevation view in Fig. 4 that the reflector must be turned about a horizontal axis through O until it points along the prolongation of the line CO.

Suppose this second horizontal axis is again a rigid rod extending out to one side, and provided with a second ruler which projects down to the level of the screen and just alongside one edge (say AB) of that screen. This ruler lies parallel in elevation to the line of sight. Therefore when C is in the field of vision this second ruler will intersect the plane of the screen on the line BC.

This gives a definite fix for C—we know that it lies on the intersection of the line BC and the line OC in the plan—if we also happen to know that the area ABCD is truly flat.

If now this second ruler is moved along the edge of the screen from B to some point intermediate between A and B, still leaving the first horizontal ruler along the line OC, the image of the point G will come into view and obviously the correct position in which to plot G is the intersection of the line OC and one drawn at right angles to AB past the edge of the second ruler.

Given such an arrangement and still assuming that ABCD is flat the process of finding the correct position for the projector is obviously fairly simple. Three base points in the area ABCD must be fixed by ground methods and accurately plotted on the "screen." The horizontal ruler is laid on the screen to pass through the plot of the first point, and the second inclined one to lie at the correct distance along the edge AB of the screen. The projector must now be manœuvred until the image of this first point is seen centrally in the telescopic eyepiece without disturbing this setting of the rulers. This process must be repeated for the second and third points with constant checking that the previous setting has not been disturbed. When a position for the projector has been found such that setting the two rulers for the correct positions for any one of the three points brings the image of that point into the field of view the projector is accurately set, and the position of any point in the photograph can be fixed directly from the position of the two rulers when the image of that point is seen in the telescope.

If the area ABCD is not flat the process is less simple The three fixed points may not all be at the same level. In this case the "fix" of each point must include fixing of height as well as position. To set the projector correctly the screen must be set to a height above any convenient datum level which to the scale of plotting represents the height of each point as well as adjusting the rulers to correspond with its plan position, and then getting the image of that point into the centre of the telescopic field.

Having done this the correct position of any point is shown on the plot by the position of the rulers only when the screen is at the height above datum corresponding to the true height of that point. Therefore that position cannot be fixed unless the height of the point can be known.

To overcome this difficulty it is necessary—as in the case of the magic lantern scheme—to have two sets of overlapping photographs and a second projector with telescopes and rulers. If these are as represented by the dotted lines on the right of Fig. 4, and the second projector is assumed for the moment somehow to have been correctly placed, it will be seen that to get the image of any point (G, say) into the telescopic field the horizontal rulers of No. 2 projector must pass over the correct plot position of G. The same thing is true for the first projector.

Therefore in order that G may be visible in both telescope eyepieces at the same time the two horizontal rulers must intersect at the point on the plotted plan corresponding to G and therefore the two horizontal rulers alone give a fix for the plan position of any point in view in both telescopes at any one time.

If G is not on a level plain but is on a hill (see the elevation in the lower part of Fig. 4) and the inclined rulers are set to intersect the edge of the plotting board abreast of G's plan position and in the plane of that board it can be seen that the two telescopes are pointed correctly for G_0 a point vertically below G but that the images seen in the two telescopes will not be images of the point G but of two different points G_1 and G_2 on the hillside.

To get G into each eyepiece the inclined rulers must be repointed until they intersect one another, not at the edge of the plotting board but at a height above that board corresponding to G's real height—which can therefore be measured directly as soon as the two images of G are seen correctly.

A very simple addition to the mechanism above will greatly simplify operations. Both the horizontal and inclined rulers of projector No. 1 may be coupled to the corresponding rulers of projector No. 2, say, by a pin passing through a central slot in each ruler. Now by merely moving the pin coupling the two horizontal rulers together to any desired point on the plotting board, both telescopes are automatically caused to take up their correct bearing angle for this point. By moving the pin coupling the two inclined rulers along the edge of the board until the pin is abreast of the position of the first pin and then raising—or lowering—that pin until images of the same point appear in the two eyepieces simultaneously, the true position of the point forming those images is fixed completely by the points of intersection of the two sets of rulers.

It should be remarked here that when this object is secured accurately the two images seen one with each eye simultaneously fuse to form a stereoscopic view, with the object in the centre of the field not only in line with the index cross wires in the eyepiece but also apparently on precisely the same level, while points in the neighbourhood but not actually level with this central part appears to be above or below the index marks.

Both the Autocartograph and the Aerocartograph employ mechanisms similar in prinicple to that described above. They both embody a pair of projectors, each provided with such a telescope system as has been described. The "pointing" of each telescope is controlled by pointer bars, which can be set to point to any desired position on the plotting surface

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merely by setting pointers on accurate scales to the proper co-ordinates.

The setting of the projectors to the correct position to correspond to scale with the position of the cameras which took the photographs is carried out by setting the scales to appropriate positions for each of the three base points—which are known and determined—and manœuvring the projectors to get the images of the points properly centred in the telescope field. This is—for the first photograph at least—a process of trial and error, and may be troublesome. It is greatly simplified for the setting of the second photograph by the fact that the first being correctly set, and the image of the first base point of the second photograph having been coaxed into the field of the second telescope, then that second image will fuse with the first image and give a stereoscopic effect if, but only if, the second photograph is very nearly correctly placed.

Thus having got this second image into view with the pointers set correctly, the operator places both eyes to the eyepieces, and manœuvres the second projector till the two images fuse perfectly. Very little further adjustment can then be necessary to get the two sets of images of the other two points similarly to fuse when the pointers are set to their correct places.

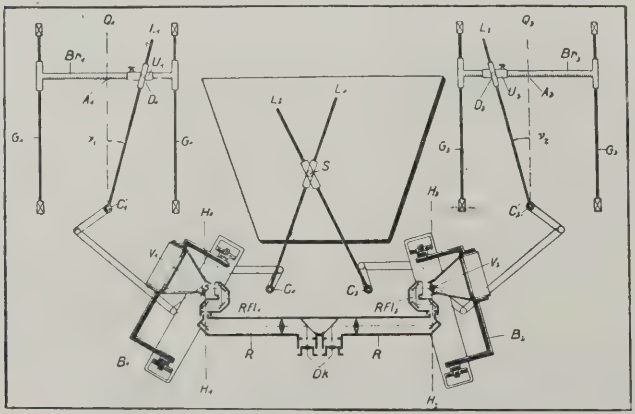
Thereafter the position of any other point can be determined by merely getting both images of that point—one in each eyepiece—to fuse correctly when both eyes are at their respective eyepieces, and reading off co-ordinates and heights from the proper scales. Moreover by attaching a pencil to the intersection point of the two horizontal rulers and pressing it on the plotting paper, the position of the particular point then correctly in view in the telescopes is marked on the plan. Thus the course of a road or river may be dotted in quite mechanically. Similarly by setting the height scale to any desired figure—corresponding to a definite altitude—and traversing the field of vision across the area photographed, all points which are in fact at that height are seen as sharply defined images apprently level with the index marks in the telescope. By pressing the pencil as each such point is brought on to the cross-wire lines of equal height—contours—can be plotted.

The actual mechanical details of these instruments are too complicated to describe fully. The Aerocartograph, which is a large and bulky instrument, suitable only for use at a permanent and fully occupied plotting station is shown diagrammatically in Fig. 5. Here the two projectors are mounted each on an adjustable carrier. Each carrier can be rotated bodily about a vertical axis V_1 or V_2, passing through the optical centre of the projecting lens. A link motion connects this carrier to the ends of the two "horizontal" rulers L_2 and L_4.

Facing the lens of each projector is one reflector, RFL_1, or RFL_2, of the telescope system. Each of these reflectors can rotate about the horizontal axis H_1 or H_2. These axes also pass through the optical centre of their respective lenses. Movement of these reflectors is transferred by other sets of link-work to the "inclined" rulers L_1 and L_2, one on each side.

The "horizontal" rulers L_3 and L_4 are coupled together by the slider S. Setting this slider to any position on the plotting board automatically points the two reflectors RFL_1 and RFL_2 to the bearing of the point which should appear at that position in the map.

The "inclined" rulers—which are here actually made to lie horizontally—are each of them attached to sliders which move along transverse scales. These scales in turn can move backwards and forwards along fore-and-aft scales. Thus setting both sliders to the same figure on the transverse scale and setting that scale at the same distance along the fore-and-aft guides has the same effect as causing the two inclined rulers of the elementary apparatus already described to intersect at the corresponding position, and points the projector lens at the correct angle of elevation.



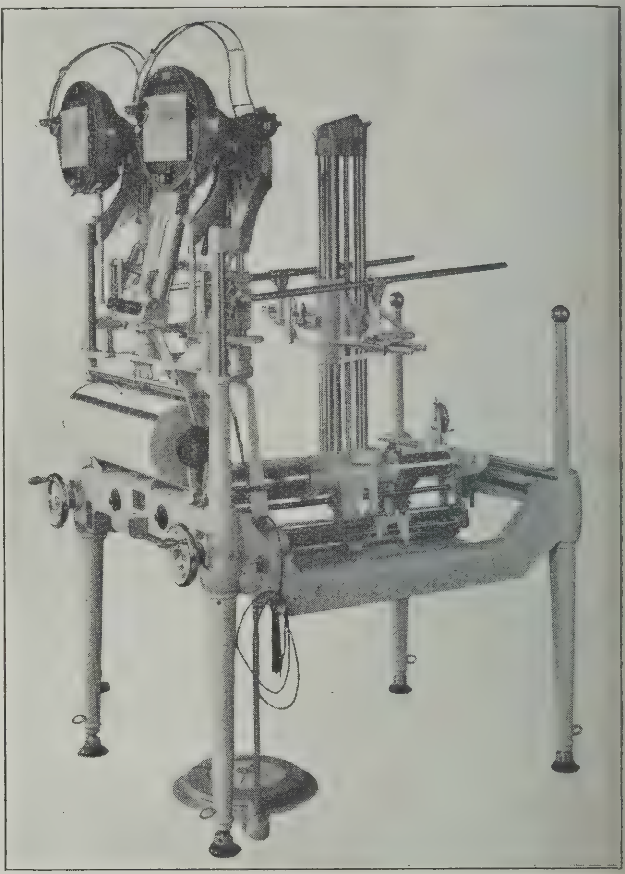


Fig. 6.

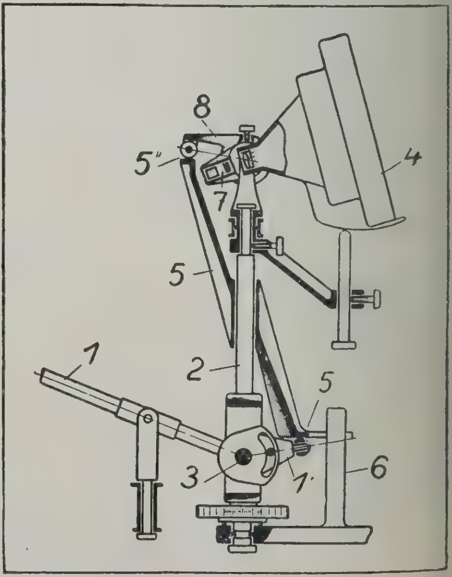
The Aerocartograph is a much more compact machine, weighs only 240 kg. (530 lbs.) and can be transported and used mounted on an ordinary motor truck. It is intended for use both in the field and at a fixed base, and it is mechanically rather simpler than the Autocartograph.

It is shown in Fig. 6. The overall height of this machine is about 1.8 metres (6 ft.) and it occupies a floor space 0.9 x 1.29 metres (3 ft. x 4 ft. 3in.) only.

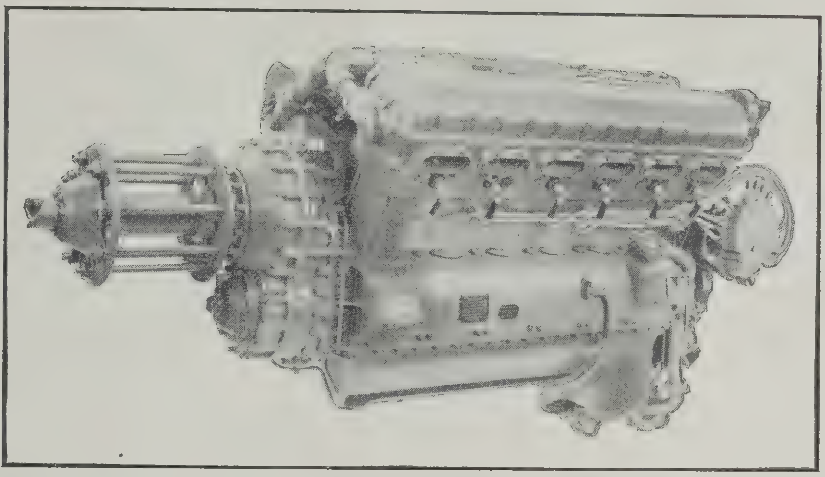
The essential feature of the Aerocartograph mechanism is shown in Fig. 7. The projectors (4) are mounted so that they may rotate about the vertical spindle 2. With this spindle the guide bar or ruler 1 must also rotate. This bar is also pivoted about the horizontal axis 3, and movement about this axis moves the ball-ended extension 1′ and moves the bracket 5 up and down the vertical spindle 2.

On the top of 5 at 5″ the lever 8 bears. This lever in turn pivots about a horizontal axis which passes through the optical centre of the projector lens, and carries with it the reflector 7 of the corresponding telescopic system.

Movement of the guide bar 1 thus moves the reflector through an equal angle. Movement of the same guide bar



Figs. 5 (left) and 7 (right).



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through a horizontal angle carries the projector with it. Thus this one bar serves as a combination of the separate plan and elevation guide bars of the Autocartograph.

The point of intersection of the two of these bars—one attached to each projector—thus gives by its position in plan view the correct position of the corresponding point shown in the two correctly fused images, and by its elevation serves to measure levels.

The method of setting the instrument follows that used in the larger instrument. The precise position of the point of intersection of the guide bars is set by bringing pointers to the desired figures on two co-ordinate scales and one height scale. If the projectors are correctly placed in their holders this setting secures that the telescopes are pointed correctly to the images of the points which occupy the position thus defined, and once correct setting has been secured accurate plotting is a mechanical process.

It will be obvious that once the first pair of photographs have been set correctly in the projectors and plotted, using the original base as a guide, the first photograph can be discarded, a third one which overlaps the second can be set correctly by using three other points in the second photograph which have already been plotted as a secondary base, and that this process can be repeated almost indefinitely.

Even the Aerocartograph is an expensive machine—costing something like £3,000. This fact is not altogether surprising. The machine is really a highly accurate scientific and optical instrument, and it requires the most accurate of workmanship throughout.

The relatively small demand for air survey, the fact that the greater part of that demand comes from districts where surveys of approximate accuracy are much preferable to no survey at all, and the further fact that with skilled flying on the part of the photographic pilot surveys of very reasonable accuracy can be made without the use of such expensive instruments naturally retards the development of more accurate methods involving increased outlay on the part of the surveying firm.

But as the value of air survey becomes more widely recognised, and the saving of time possible by the covering of large areas by air photography is appreciated, the initial cost of such plotting machines will become unimportant when the speed and accuracy of mapping which they make possible is taken into account, and finally they must become part of the equipment of all really well-equipped aerial surveyors.

The Hugershoff firm have already sold about twenty of these two types of mapping machines, mostly to Government Departments. One instrument has been supplied to Denmark for plotting a photographic survey of Greenland. It is easily understandable that a survey of Greenland by ordinary methods would be a hopeless business. Aerial photography in this case would also have its difficulties—but these plotting machines are quite impartial as to the methods used for obtaining the photographs and can be used to map from horizontal photographs—which it is believed are to be used in Greenland.

Another instrument—an Aerocartograph—has recently been supplied to Persia where it is to be used for plotting the survey for the new Persian railway from Baku to Teheran and on to Bushire. This line is to be built in two sections, one by a German, and one by an American, group of constructors.

Before deciding to use aerial photography and an Aerocartograph for this job a careful test of the method was made by surveying an area round Dresden. The resulting map was then checked by ground measurements, and a maximum error of position of 35 cm. (say 14 inches) was thus found.

Persia is an exceedingly mountainous country, and the decision that such a type of survey is good enough for railway work in that country is very strong evidence of its occuracy.

With an enterprise that deserves the widest recognition, Henry Hughes and Son, Ltd., of 59, Fenchurch Street—well-known as manufacturers of marine and aeronautical instruments—have acquired the British rights for these Hugershoff plotting machines, and will be ready to meet British demands for such instruments when that demand arises—as it certainly will do in the future.

NEW AEROPLANES.

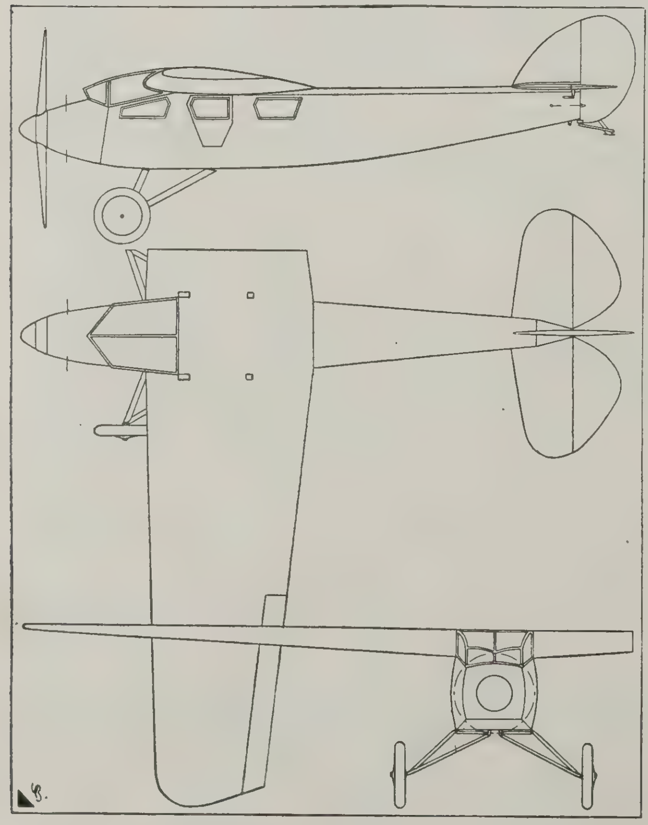
The Cessna Monoplane.

Made by The Cessna Aircraft Co., Wichita, Kansas. Four-seater cabin monoplane.

Wings.—High wing cantilever monoplane, tapering in chord and thickness towards tips. Unbalanced ailerons of very small chord and total area. Spruce spars, three-ply covering.

Fuselage.—Rectangular section, welded construction of chrome-molybdenum tube. Top longerons slope downwards from lower wing surface to engine mount forward and continue the chord line to the tail.

Tail Unit.—Conventional monoplane type, with unbalanced control surfaces. Framing welded chrome-molybdenum tube fabric covered and devoid of external bracing.



Undercarriage.—Split-axle Vee type. Wheel brakes may be fitted if required. Rubber cord shock absorbers. Steerable tail-skid.

Power Plant.—One Wright Whirlwind 230 h.p. engine (120 h.p. Anzani or 125 Ryan-Siemens engine are alternative). Two fuel tanks (20 U.S. = 16.6 Imp. gallons = 75 litres each) in wings on each side of fuselage.

Accommodation.—Two seats side-by-side below leading edge of wing, with front, top and side wind-screens. Dual control fitted. Two further side-by-side seats in cabin below wings.

Dimensions.—Span 40 ft. 6½ in. (12.62 m.), Length 23 ft. 8½ in. (7.22 m.), Height 7 ft. 4 in. (2.23 m.), Wing area 224 sq. ft. (21 sq. m.).

Weights and Loadings.—Weight empty 1,250 lbs. (568 kg.), Fuel and oil 300 lbs. (136 kg.) approximate, Pay load 550 lbs. (250 kg.), Loaded weight 2,300 lbs. (1,045 kg.), Wing loading 10.25 lbs./sq. ft. (5 kg./sq. m.), Power loading, Whirlwind engine 10 lbs./h.p. (4.45 kg./h.p.), Ryan-Siemens engine 18.4 lbs./h.p. (8.2 kg./h.p.).

Performance.—Whirlwind engine, maximum speed 150 m.p.h. (240 km.h.), Minimum speed 45 m.p.h. (72 km.h.), Climb at sea level 1,400 ft./min. 427 m./min., Ceiling 18,000 ft. (5,470 m.), Ryan-Siemens engine, maximum speed 125 m.p.h. (200 km.h.), Ceiling 15,000 ft. (4,570 m.).

The Ireland Amphibian Neptune.

Made by The Ireland Aircraft Inc., Garden City, N.Y., U.S.A. (Five-seater civil amphibian flying-boat.)

Wings.—Staggered biplane, equal chord, top wing overhanging lower wing. Top centre-section with oval steel tube spars and duralumin ribs carried on two sets of steel tube N struts. Outer wings with spruce box-spars, spruce girder ribs and duralumin tube drag-struts. One pair interplane struts with incidence wires per side. Curtiss C.72 wing section.

Hull.—Two step, straight Vee bottom type. Framing, ash longerons and spruce bracing. Skin of duralumin sheet fastened with cadmium-plated screws. All-steel fittings, cadmium-plated.

Tail.—Horizontal tail plane carried above hull on fin structure and strut braced. Elevators and rudder horn-balanced. Tail framing of welded steel tube.

Alighting Gear.—(See Hull.) Wing tip floats wood framed and duralumin covered. Wheels carried on two steel tube tripods. Two members of tripod hinged to hull, third hinged to a strut which is extended or retracted by a worm gear. Wheels when folded lie against under surface of lower wings. Front leg of tripods telescopic with oleo-shock-absorber. Conventional tail skid at stern of hull.

Power Plant.—One Wright Whirlwind engine type J-5-C 230 h.p. supported below C.S. rear spar, driving Curtiss-Reed pusher airscrew. Small gravity fuel tank in C.S., pump-fed from main tank in hull. Full capacity 71 American (59 Imp.) gallons.

Accommodation.—Two open cockpits ahead of lower wing. Front one with two seats side-by-side and dual control. One aft with three side-by-side seats.

Dimensions.—Span, top, 40 ft. (12.2 m.), bottom, 34 ft. (10.7 m.), Length 30 ft. 6 in. (9.3 m.), Height on wheels 11 ft. 6 in. (3.5 m.), Wing area 350 sq. ft. (32.5 sq. m.).

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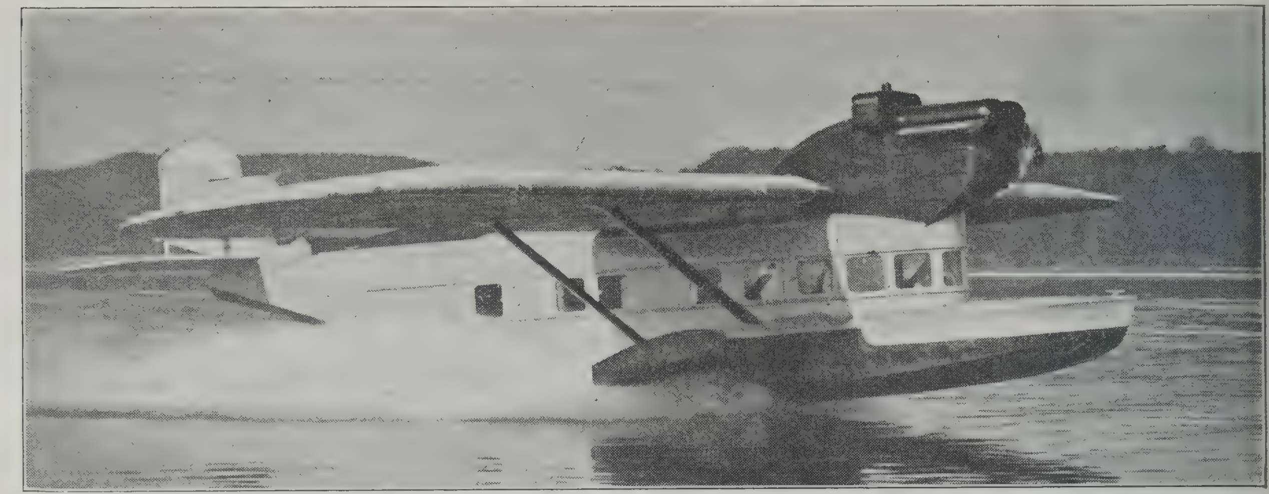


The Dornier Delphin III (B.M.W.VI engine, 450/600 h.p.).

Weights and Loadings.—Weight empty 2,000 lbs. (907 kg.), Loaded 3,358 lbs. (1,530 kg.), Fuel 456 lbs. (207 kg.), Pay load 750 lbs. (342 kg.), Wing loading 9.6 lbs./sq. ft. (47 kg./sq. m.), Power loading 14.6 lbs./h.p. (6.7 kg./h.p.).

Performance.—Max. speed 99 m.p.h. (159 km./h.), Landing speed 46 m.p.h. (74 km.h.), Climb, at sea level, 650 ft. (198 m.) per min., to 10,000 ft. (3,050 m.) 35 min., Range at 85 m.p.h. (137 km.h.) 500 miles (805 km.) = 5.9 hours.

(*Aviation*, Nov. 28, 1927, p. 1291.)

The Dornier "Delphin III."

Made by The Dornier Metallbauten G.m.b.H., Friedrichshafen. Single-engined commercial flying-boat.

Wings.—Strut-braced monoplane. Wing of fairly thick section parallel in chord and thickness throughout. Built on two steel spars, duralumin covered.

Hull.—Of special Dornier type. Sharp stem and slight Vee bottom with stump wings growing out of bottom to give lateral stability on water. Forward the hull is shallow and nearly flat decked. A little back from the stem a cabin superstructure is built up from the hull proper to the level of the wing and the top line of this cabin is carried back to the tail. Entirely built of duralumin.

Tail Unit.—Normal monoplane type. Unbalanced elevators, balanced rudder. Duralumin framed and covered.

Power Plant.—One B.M.V. VI engine 450/600 h.p. This is carried a nacelle built onto the forward part of the wing and the top of the cabin superstructure, which it overhangs, giving clearance for the airscrew above the forward decking of the hull. Two fuel tanks (285 litres = 63 gallons each) in wings. One oil tank (60 litres = 13 gallons) in engine nacelle.

Accommodation.—Two side-by-side seats with dual control in nose of cabin superstructure. Ten seats for passengers behind this.

Dimensions.—Span 19.6 m. (64 ft. 2 in.), Length 14.35 m. (47 ft. 0 in.), Height 3.9 m. (12 ft. 10 in.), Wing area 62 sq. m. (668 sq. ft.).

Weights and Loadings.—Weight empty 2,400 kg. (5,280 lbs.), Normal weight fully loaded 3,700 kg. (8,140 lbs.), Maximum permissible weight 4,000 kg. (8,800 lbs.), Wing loading (normal) 59.6 kg./sq. m. (12.2 lbs./sq. ft.), Power loading (500 h.p.) 7.4 kg./h.p. (16.3 lbs./h.p.).

Performance.—Maximum speed 190 km.h. (118 m.p.h.), Cruising speed 150 km.h. (93 m.p.h.).

The Lublin R.VIII.

Made by Plage and Laskiewicz, Lublin, Poland. Two-seater bombing and reconnaissance machine.

Wings.—Single bay biplane, lower wing of equal chord but smaller span than top. No stagger. Ailerons on all wings, fitted with Avro type balancing surfaces.

Fuselage.—Rectangular section, very deep and narrow.

Undercarriage.—Split-axle type with very wide tread. Axles supported by streamline "trousers" from lower wing which is supported above by diagonal struts from top of fuselage.

Power Plant.—550 h.p. "W" type Farman engine with reduction gear. Retractable underslung radiator.

Accommodation.—Two open cockpits in tandem behind wing. Rear one fitted with Scarff-ring. No other details of military equipment available.

Dimensions.—Span 17.0 m. (55 ft. 10 in.), Length 10.0 m. (32 ft. 10 in.), Height 4.15 m. (13 ft. 7 in.), Wing area 74 sq. m. (800 sq. ft.).

Weights and Loadings.—Weight loaded 3,550 kg. (7,810 lbs.), Wing loading 48 kg./sq. m. (9.76 lbs./sq. ft.), Power loading 6.45 kg./h.p. (14.2 lbs./h.p.).

Performance.—Maximum speed 180 km.h. (112 m.p.h.), Landing speed 90 km.h. (56 m.p.h.), Endurance 6 hours.

The Spad 91.

Made by Bleriot Aeronautique, Quai Maréchal Gallieni, Suresnes (Seine). Single-seat fighter to French "Jockey" specification.

Wings.—Single bay biplane, wings of equal span and chord, upper wing with characteristic "Spad" sweepback. Upper wings, in two sections, join on centre-line of machine and are supported by two sets of N struts. Lower wings are attached to two wing-roots built into fuselage. There is one I interplane strut per side. Unbalanced ailerons fitted to lower wing only. Wing spars are duralumin tubes rolled to rectangular section. Ribs are also duralumin.

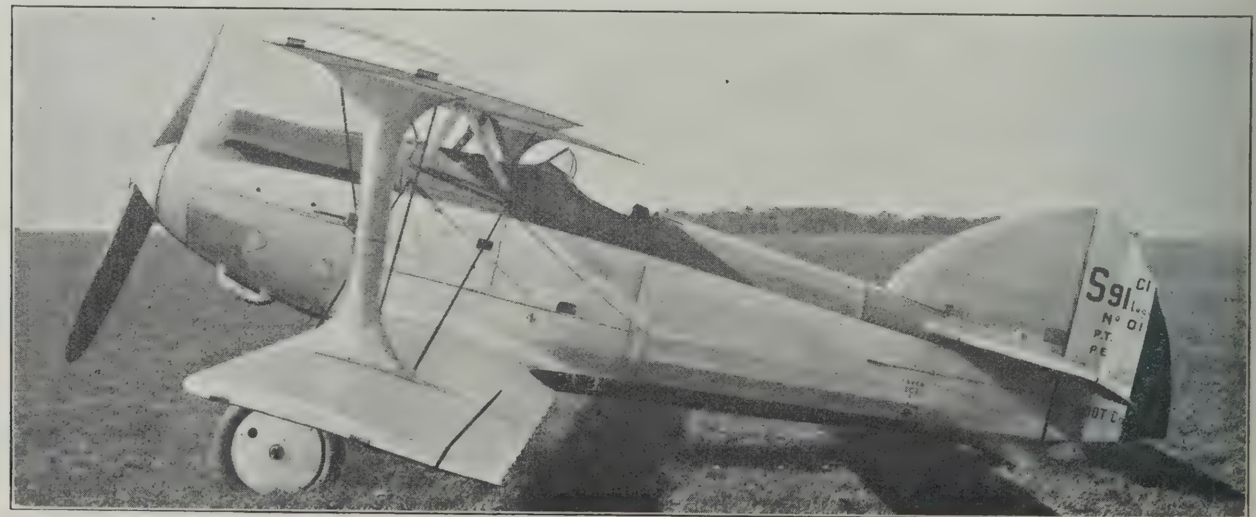
Fuselage.—Oval section. The front section is built on channel section duralumin formers, duralumin covered. Behind the cockpit the fuselage is built on duralumin tube longerons, braced by a triangulated system of struts. This section is covered with fabric.

Tail Unit.—Of normal monoplane design, duralumin framed and fabric covered. Tail plane adjustable in the air.

Undercarrriage.—Cross-axle Vee type. The axle is rigidly fixed to the Vees, and the wheels are fitted with an internal springing arrangement.

Power Plant.—One Hispano-Suiza 500 h.p. (V type) engine. Fuel tank (droppable) in fuselage ahead of pilot. Lamblin strut type radiators on undercarriage legs and a Lamblin oil-cooler on lower face of fuselage.

Accommodation.—Cockpit below and behind trailing edge of upper wing and above trailing edge of lower wing, which is cut back at each side to improve the view downwards. Two synchronised machine-guns fitted.



The Spad 91 single-seat fighter (500 h.p. Hispano-Suiza engine).

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A Squadron of Vickers "Vernon" (Napier Lion Engines) Troop Carrier and Ambulance Aircraft in Iraq, where they are employed by the Royal Air Force in the maintenance of our Imperial Lines of Communication.

R.A.F. Photograph. Crown Copyright Reserved.

Visit the Royal Air Force Display at Hendon, 30th June, 1928.

DIMENSIONS.—Span 8.65 m. (28 ft. 5 in.), Length 6.52 m. (21 ft. 4 in.), Height 2.94 m. (9 ft. 8 in.), Wing surface 22 sq. m. (237 sq. ft.).

WEIGHTS AND LOADINGS.—Weight fully loaded 1,450 kg. (3,190 lbs.), Wing loading 66 kg./sq. m. (13.5 lbs./sq. ft.), Power loading 2.9 kg./h.p. (6.38 lbs./h.p.).

PERFORMANCE.—Speed at 4,000 m. (13,120 ft.) 270 km.h. (168 m.p.h.), Ceiling 8,000 m. (26,240 ft.).

The Thaden Monoplane.

MADE BY THE THADEN METAL AIRCRAFT CO., San Francisco, California. Six or eight passenger cabin monoplane.

WINGS.—Strut braced high wing monoplane. Parallel chord and section. Duralumin box spars, corrugated duralumin covering. Removable panels for inspection arranged on under surface of wings. Small narrow-chord unbalanced ailerons.

FUSELAGE.—Corrugated duralumin skin supported on oval bulkheads, without longitudinals. Bulkheads over cabin section built up sections, aft of cabin bulkheads of tube.

TAIL UNIT.—Conventional monoplane type with horn-balanced rudder and unbalanced elevators. Duralumin framing, duralumin covered.

UNDERCARRIAGE.—Split-axle type. Axles hinged below centre of fuselage and supported by backward raking struts hinged on same line. A telescopic member from axle to front wing strut is fitted with oleo-pneumatic shock absorbers. The wing strut is supported at joint with undercarriage leg by one strut up to top of fuselage and one running inward and forward horizontally to the fuselage. Sauzedde wheels and independently-controlled brakes fitted.

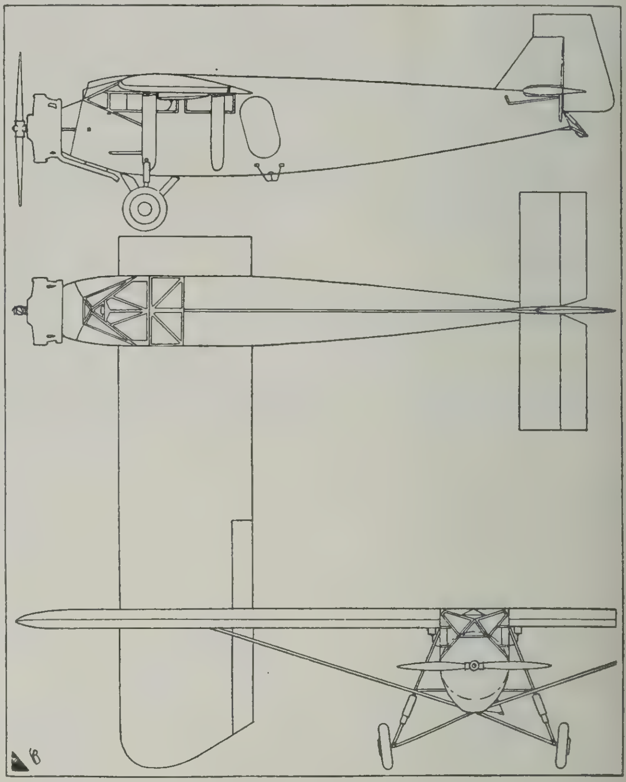
POWER PLANT.—One Pratt and Whitney Wasp radial of 425 h.p. on a welded steel tube mount attached to the forward bulkhead of fuselage. Fuel tanks (120 U.S. = 100 Imp. gallons = 455 litres total capacity) in wings with fuel lines entirely outside of fuselage. Standard Steel Corporation adjustable airscrew.

ACCOMMODATION.—Pilot's seat in line with leading edge completely enclosed in non-splinterable glass shields. No partition between pilot's seat and cabin aft. This contains six or eight wicker seats for passengers. Side-door entrance and permanent step on port side of machine. Baggage compartment aft of cabin.

DIMENSIONS.—Span 53 ft. (16.1 m.), Length 35 ft. (10.7 m.), Height 11 ft. (3.35 m.), Wing area 360 sq. ft. (33.5 m.) approximate.

WEIGHTS AND LOADINGS.—Weight empty 2,900 lbs. (1,318 kg.), Fuel 760 lbs. (345 kg.), Pay load 1,400 lbs. (637 kg.), Total weight 5,300 lbs. (2,410 kg.), Wing loading 14.7 lbs./sq. ft. (72 kg./sq. m.) approximate, Power loading 125 lbs./h.p. (5.66 kg./h.p.).

PERFORMANCE.—Maximum speed 130 m.p.h. (209 km.h.), Landing speed 52 m.p.h. (83 km.h.), Range 6 hours at 115 m.p.h. (185 km.) 630 miles (1,010 km.).



NEW ENGINES.

The "Air-Cat" Engine.

MADE BY THE LE BLOND MACHINE TOOL CO., Detroit, Mich. For light sporting aircraft.

TYPE.—Five-cylinder air-cooled radial.

CYLINDERS.—4⅛ in. (109 m/m.) bore, 3¾ in. (95 m/m.) stroke. Cast iron with integral heads and hemi-spherical combustion space. Two diagonal valves per cylinder, push-rod and rocker operated.

PISTONS.—Aluminium alloy castings, fitted with three rings above gudgeon-pin.

CONNECTING RODS.—Split white metal big-end bearing in master-rod, four auxiliary rods articulated round big-end.

CRANKSHAFT.—One piece single throw type. Carried in ball bearings, of which the front is a combined thrust and journal bearing.

CAM GEAR.—One cam-ring with three lobes concentric with crankshaft operating all ten valves. Cam gear at back of crankcase.

AUXILIARY GEAR.—Two Scintilla magnetos, type A.P.5, carried transversely from rear cover of crankcase. Gear type scavenger and pressure pumps, with filters and relief valve in one removable unit below magnetos. Zenith Model 76 carburettor carried below crankcase rear cover and supplying gas to induction chamber integral with crankcase, whence it flows to inlet valves through tangential inlet pipes.

AIRSCREW DRIVE.—Direct.

MAXIMUM OUTPUT.—80 b.h.p. at 2,400 r.p.m.

WEIGHT, BARE.—200 lbs.

CONSUMPTION.—Fuel 0.52 lbs. per h.p. hour, Oil .03 lb. per h.p. hour.

The Colombo S.53 Engine.

DESIGNED BY MESSRS. COLOMBO AND LUVA. Builders not mentioned.

TYPE.—Four cylinder in line, air-cooled, for sporting and training service.

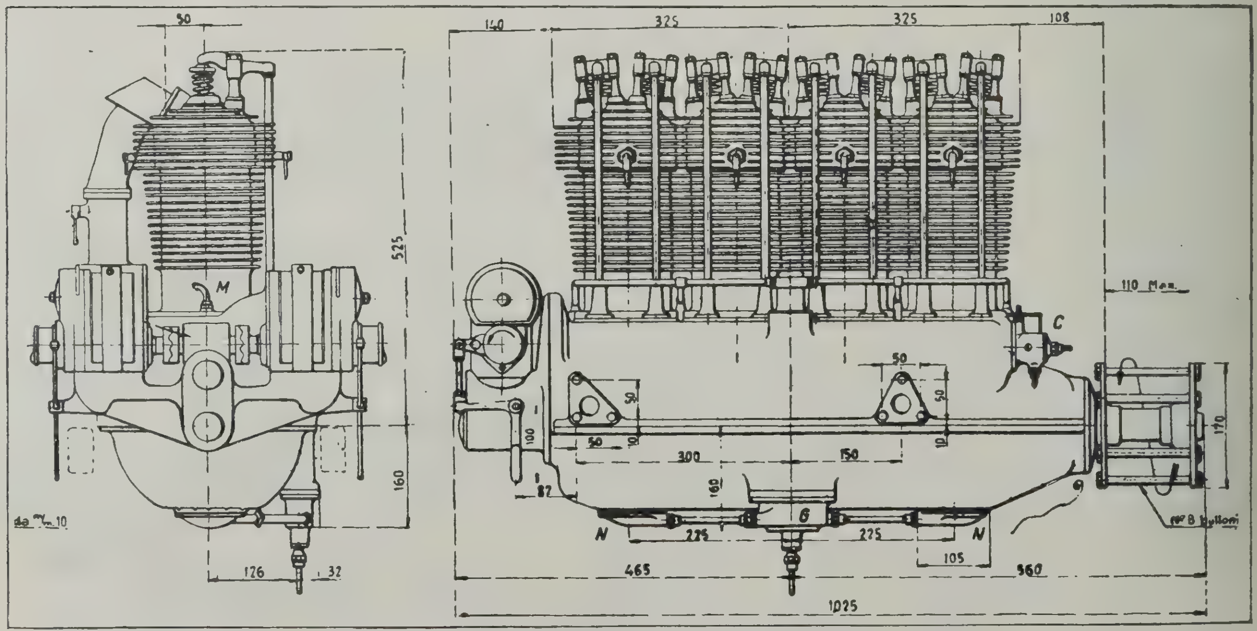
CYLINDERS.—114 m/m. (4½ in.) bore, 140 m/m. (5½ in.) stroke, Barrels steel castings with detachable aluminium heads. Two overhead valves per cylinder with exhaust and inlet ports both on port side of engine.

PISTONS.—Aluminium alloy. No other details available.

CONNECTING RODS.—No details available.

CRANKSHAFT.—Normal four-throw type carried in bronze bearings with a ball thrust race at airscrew end.

CRANKCASE.—Magnesium alloy castings. Split on line of crankshaft centre.



The Colombo S.53 air-cooled engine of 80 h.p.

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REYNOLDS

R.H.S.

Valve Gear.—Camshaft carried in upper half of crankcase. Valves operated by push-rods and rockers.

Lubrication.—Dry sump system with forced feed to all main bearings.

Auxiliary Gears.—Two magnetos on transverse brackets at rear of crankcase driven by skew gear from crankshaft end. Plain spur drive to side camshaft. Oil pumps apparently driven from front end of camshaft.

Carburation.—Vertical carburettor carried centrally on port side of cylinders. Carburettor oil-jacketted.

Airscrew Drive.—Direct.

Overall Dimensions.—0.685 m. (27 in.) high, 0.370 m. (14½ in.) wide, 1.025 m. (40 in.) long, Height above thrust line 0.525 m. (20⅝ in.).

Weight.—120 kg. (264 lbs.).

Performance.—Normal output 80 b.p.h. at 1,700 r.p.m.—(*Aeronautica (Milan), June,* 1928.)

The "Dayton Bear" Engine.

Made by The Dayton Airplane Engine Co., Dayton, Ohio, U.S.A.

Type.—Four-cylinder in line air-cooled engine for sporting and light commercial service.

Cylinders.—4½ in. (114 m/m.) bore, 7 in. (178 m/m.) stroke, 5.3 compression. Barrels nickel-iron castings with aluminium-alloy heads held on by long bolts running through crankcase to crankshaft main bearings. Hemispherical compression space with two overhead valves seated in aluminium-bronze seats. Two spark plugs per cylinder at each end of a transverse cylinder diameter.

Pistons.—Aluminium alloy castings with three rings all near top of pistons. Gudgeon-pin floats in piston.

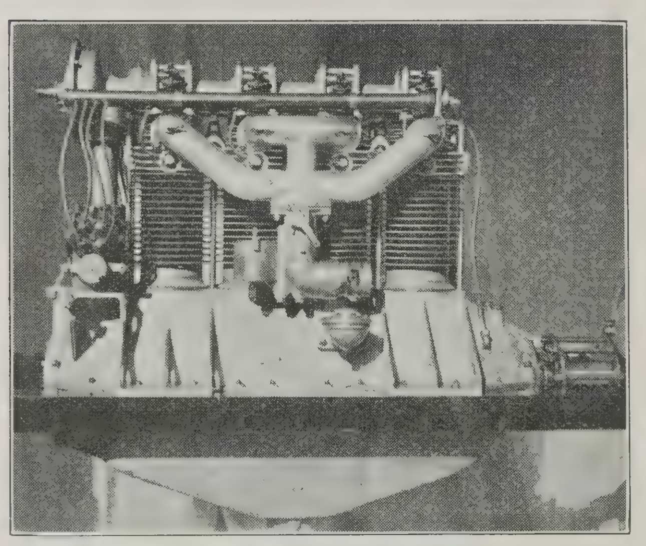
Connecting Rods.—Steel, channel section, white-metal lined big-ends.

Crankshaft.—Normal four-throw type carried in five steel-backed white-metal journals. The bolts from these bearings run right through to the cylinder heads. A double ball-thrust is fitted at airscrew end.

Crankcase.—Aluminium-alloy casting in two parts split on a horizontal plane. The upper half carries all crankshaft bearings, and the lower serves purely as an oil sump of 2 gallons capacity.

Valve Gear.—Overhead camshaft completely encased with rocker arm gear.

Lubrication.—Wet sump type with pressure feed to all journal bearings. Oil pump submerged in base of crankcase. A special gear drive is provided to which an extra oil pump may be attached and the engine may then easily be converted to a dry sump type, without other alteration.



Auxiliary Gears.—Two magnetos with transverse shafts mounted at rear of engine and driven from the vertical camshaft drive shaft. The rear end of the crankcase is arranged to take any standard American starter gear, and to allow of the fitting of the extra oil pump mentioned and of a fuel pump.

Carburation.—One carburettor (type not specified) carried on starboard side of engine above top of crankcase.

Airscrew Drive.—Direct through tapered hub-seating and single key.

Overall Dimensions.—38½ in. (0.98 m.) high, 18½ in. (0.47 m.) wide, 48 in. (1.22 m.) long, height above thrust line 25⅞ in. (0.66 m.).

Weight.—Less airscrew hub 375 lbs. (171 kg.).

Performance.—Normal output 110 b.h.p. at 1,550 r.p.m., Max. 120 h.p. at 1,750 r.p.m., Fuel consumption 0.51 lbs. (0.23 kg.) per h.p. hour, Oil consumption 0.175 lbs. (0.08 kg.) per h.p. hour.

Price.—$1,600 (£330) f.o.b. Dayton.

Note.—The makers state that arrangements have been made for an output of 300 engines of this type per month.

The Issotta-Fraschini 430/500 h.p. Air-cooled Engine.

Made by La Fabrica Automobili Issotta Fraschini, Milan.

Type.—Twelve-cylinder 60° Vee, air-cooled.

Cylinders.—125 m/m. (4.92 in.) bore, 140 m/m. (5.5 in.) stroke, 5.7 compression ratio. Steel barrels with aluminium heads. Four valves per cylinder.

Pistons.—No details.

Connecting Rods.—No details.

Crankshaft.—No details.

Crankcase.—Aluminium alloy casting, in three parts, the lowest being a sump.

Valve Gear.—Totally enclosed overhead camshaft type.

Auxiliary Gears.—Two twelve-cylinder magnetos transversely across rear of crankcase with skew-gear drive. Gas starter distributor above magnetos.

Carburettors.—Four carburettors, outside cylinder blocks, each feed three cylinders through passages in cylinder heads.

Airscrew Drive.—Direct.

Cooling.—Air from slipstream is received into a duct between cylinders formed by cowling between cylinder heads. A series of guide vanes inside this duct directs separated air streams onto the inner side of cylinders whence it escapes outwards.

Weight.—315 kg. (737 lbs.).

Performance.—Normal 430 b.h.p. at 2,200 r.p.m., Maximum 500 b.h.p. at 2,600 r.p.m., Fuel consumption 0.23 kg. (.51 lbs.) per h.p. hour, Oil consumption .015 kg. (.033 lbs.) per h.p. hour.—(*Der Flug, No.* 10, 1928.)

The Velie M.5 Engine.

Made by Velie Motors Corpn., Moline, Illinois, U.S.A. Five-cylinder air-cooled radial for sporting or light commercial service.

Cylinders.—4⅛ in. (109 m/m.) bore x 3¾ in. (95 m/m.) stroke. 5.2 compression ratio. Cast steel barrels held to crankcase by studs passing through an integral flange. Detachable cylinder heads of cast aluminium alloy ("Lynite") held by four studs each. Two inclined valves seat in aluminium bronze seats in a hemi-spherical combustion space. Two spark plugs arranged at opposite ends of a fore and aft diameter. Inlet and exhaust ports both face rear of engine.

Pistons.—Aluminium alloy ("Lynite") with flat heads. Two gas and one scraper ring each. Gudgeon-pin floats directly in piston and also in little end of connecting rod.

Connecting Rod.—Master rod and big end one unit with undivided bearing, which is of white metal direct on the steel of the big end. The four secondary rods run on steel pins passing through circular flanges integral with the big end. All little ends, and the articulation bearings are bronze bushed.

Crankshaft.—Split type. Airscrew shaft, front crank-web and crank-pin form one unit. The crank-pin fits into the rear crank-web, is located by a key, and by a bolt through pin and web. Bronze balance weights fitted to both crank webs. Airscrew shaft runs in two ball-bearings of which one is a combined thrust and journal bearing. The rear end of the crankshaft is carried on one ball race.

Crankcase.—One aluminium alloy casting forms crankcase proper with a chamber at the rear enclosing valve and other auxiliary gear drives. A ribbed disc covers the front of the crankcase and houses the front crankshaft bearings.

Auxiliary Gears.—A single cam ring, concentric with the crankshaft, is driven by spiral gears in the rear chamber of the crankcase. Valves are controlled by roller tappet rods, push-rods and rockers in the usual way. A horizontal lay shaft, driven by skew gears from the tail of the crankshaft, drives one Scintilla magneto at each end. Two gear-type oil pumps, one pressure and one scavenger, are also provided.

Carburation.—A Zenith carburettor, mounted below crankcase between two lowest cylinders, supplies gas to an annular induction chamber at rear of crankcase. Radial inlet pipes run thence to inlet valves. Exhaust heat muff between carburettor and induction chamber.

Overall Dimensions.—Diameter 32 in. (813 m/m.), Length 27 in. (686 m/m.), Diameter of mounting ring 12¾ in. (324 m/m.).

Weight Bare.—210 lbs. (95.5 kg.).

Performance.—Normal output 70 b.h.p. at 1,800 r.p.m., Maximum 80 b.h.p. at 2,000 r.p.m., Fuel consumption at normal output .55 lbs. (.25 kg.) per h.p. hour, Oil consumption .025 lbs. (.011 kg.) per h.p. hour.

NEW BOOKS.

Air Navigation.

"Traité Pratique de Navigation Aérienne." By A. B. Duval and L. Hebrard. Published by Gauthier-Villars et Cie., Quai des Grands-Augustins, 55, Paris. 184 pp., 10 x 6 in., 123 diagrams. Price 30 francs net.

The second edition of a text-book on aerial navigation originally published in 1919, and now revised and brought up to date. This book explains simply and clearly the principles of air navigation, describes the instruments used in practice, and gives an eminently practical outline of the methods of using these instruments.

The authors do not content themselves with mere bald instructions as to what should be done. They have evidently a very extensive practical acquaintance with their subject, and their book is full of warnings as to errors to avoid.

In some parts the book will read a little curiously to anyone with experience of British methods of aerial navigation. A reference in 1928 to pilots who have no use for air speed indicators is, for instance, a little startling.

And in the section dealing with instruments the English reader will find references to a number of instruments of marked ingenuity but often of considerable complexity, together with a total neglect of certain more familiar and eminently practical types which are well known in this country. Nevertheless the book should prove both interesting and valuable to all who are concerned with Air Navigation.

Aerodynamics.

"Sur L'Aerodynamique des Ailes Sustentatrice et des Helices." By Maurice Roy. 181 pp. 10 inches x 6⅜. Published by Gauthier-Villars et Cie., 55, Quai des Augustins, Paris. Price 30 francs net.

An extended essay on the aerodynamic theory of aerofoils and airscrews, devoted rather to preparing the way for the further extension of that theory than to the practical application thereof. It is therefore necessarily a highly mathematical work, which, in the words of a French reviewer, "can only be recommended to those engineers who find juggling with the integral calculus an agreeable diversion from their usual labours."

To the worker in the domain of mathematical research the work will doubtless prove interesting, and all aeronautical engineers may properly hope that the author's efforts will lead eventually to the desired end.

THE LATEST ATLANTIC FLIGHT.

After a stay of a day or so at Burry Port the Fokker aeroplane *Friendship*, which Mr. Stultz had flown across the Atlantic on June 17-18, with Mr. Gordon as mechanic and Miss Earhart as passenger, was flown to Southampton. Here the crew and passenger were received by the feminine Lord Mayor and by Mrs. Guest, who paid the expenses of the flight.

Mr. Stultz and Mr. Gordon were entertained by the Royal Aero Club at a purely private dinner in the Club House on June 22. Attempts were made by the club to get in touch with Miss Earhart, but she was so well protected by a secretary who was looking after her financial interests that the club was unable to establish direct communication with her. Messrs. Stultz and Gordon earned the highest opinions of the members of the Royal Aero Club as good, plain, straightforward aviators who know their jobs. They were pleased with having done their flight, and they were making no attempts to get into the limelight. And the Press, left to its own devices, naturally concentrated all its rays on Miss Earhart.

On Sunday Miss Earhart paid a visit to Stag Lane and flew a Moth. Thence, also in a Moth, she was flown to Northolt, where she met various members of the R.A.F. community.

On Monday, June 25, the crew and passenger of the machine were entertained to lunch by a section of the Air League of the British Empire which calls itself the Women's Section, and is apparently under the control of Lady Heath. This seems to be a recent activity in connection with the promised regeneration of the Air League.

Quite a number of distinguished personages accepted invitations to the party. The speeches, one gathers, began late and lasted long, the Union Jack and Old Glory being vigorously flapped in unison.

A TRANS-ATLANTIC LAW CASE.

An amusing law case is starting in New York. The Harold Hartwell and Hollis Corporation, which was formed to finance the flight by Fraulein Thea Rasche, the German aviatress, from America to Germany, is suing her for breach of contract. The corporation was to have received half the profits of a successful flight, and claims that it has already spent £3,000 in publicity for Fraulein Rasche.

The aviatress has apparently accepted the backing of Mrs. James Stillman, who has supplied a Bellanca monoplane for the journey, and the claim is that by her doing so the Harold Hartwell and Hollis firm will lose numerous commercial opportunities.

The Daily Telegraph publishes this news under the illuminating heading, "Heroism or Business?"

A U.S. ROUND-THE-WORLD FLIGHT.

A dispatch from New York states that Lieut. Leigh Wade, U.S. Army Air Corps, who was one of the Army Air Service team who flew round the World in 1924, is organising a flight round the World, to be done in the course of the next few months. He is to be accompanied by Capt. Bradley Jones, of the Bureau of Navigation, and by Mr. Floyd Smith, the well-known pilot, president of the New York and Western Airways, Inc.

The projected route is from Chicago to the Pacific and thence via Honolulu, the Midway Islands, Tokyo, Hong Kong, Calcutta, the Persian Gulf, Lisbon, the Azores and Newfoundland back to Chicago.

The correspondent of *The Daily Telegraph* in New York states that a syndicate is financing the undertaking to the extent of £22,000, for the sole purpose of demonstrating conclusively the real commercial and trade possibilities of aircraft.

A SOUTH AFRICAN AIR RECORD.

The Rand Daily Mail of May 30 states:—

> By breaking the South African air speed record at Swartkop Aerodrome, Pretoria, yesterday morning, the Director of Air Services, Sir H. P. van Ryneveld, has added another laurel to his already distinguished career. Flying a D.H.9 aeroplane fitted with one of the recently acquired "Bristol" Jupiter engines, rated at 450 horse-power, Colonel Van Ryneveld attained a speed of 138 miles per hour, ten miles per hour in excess of the previous highest speed.
>
> Col. Van Ryneveld refused to divulge details of his record-breaking flight when seen by the Pretoria representative of the *Rand Daily Mail*. It is interesting to note that Col. Van Ryneveld set up a South African altitude record some time ago, and was also the first man to make a parachute descent in this country.

A speed of 138 m.p.hr. is quite good going for a D.H.9, but in justice to the Jupiter engine one can only assume that either it was badly installed, in the matter of adapting it to the shape of the machine, or that it was inadequately tuned. During the War D.H.9s with 200 h.p. Puma engines used to be about 110 m.p.hr. The D.H.4, which is much the same machine, but had Rolls-Royce Eagles of 300 h.p., used to do 130 m.p.hr. And at the Hamble meeting in May Mr. Neville Stack on a D.H.9 with an A.D.C. Nimbus of 330 h.p., did 134 m.p.hr. round a closed course. So one imagines that a well cleaned-up D.H.9 with a Jupiter could be made to do considerably over 140 m.p.hr.

BRITISH AIRCRAFT AT THE PARIS SHOW

There is satisfaction in noting that besides the new type Bristol, which hitherto has been the only British aeroplane entered for that great International Exposition, there will in fact be a second British machine at the Paris Aero-Show. This is a Supermarine S.5 seaplane, Napier engine, similar to that on which Flt. Lt. Webster won the Schneider Trophy at Venice.

It has been loaned by the Air Ministry to the French Air authorities for exhibition in the Government section of the Show. The British Aircraft Industry now owes another debt of gratitude to the Air Ministry for its enlightened action.

THE ITALIAN POLAR EXPEDITION.

On June 21 reports from Norway stated that the *Citta di Milano* had been in wireless communication with General Nobile the previous night and that messages had been received giving instructions about the work of relief aeroplanes.

Up to the time of going to press no trace had been found of Commander Guilbaud and Capt. Amundsen who started for Spitzbergen in a Latham flying-boat on June 18. On the night of June 23, Lt. Lundborg alighted on the ice close to General Nobile's tent. He was asked by General Nobile to take various other members of the party back to the ship at Virgo Bay. But he himself, acting under orders from his base, and the other members of the party, insisted that General Nobile, as chief of the expedition, should first be taken back to the base. The General is suffering from a fractured leg-bone and various other injuries.

There is interest in noting that Lieut. Lundborg was born in India of Swedish parents. He became an officer in the Swedish Army in 1918 and joined the Air Force in 1921, becoming Chief Instructor to the Army Flying School. In 1927 he came over to England and went through an instructional course with the R.A.F. at Wittering.

On June 24 Lieut. Lundborg flew back to the camp on the ice to fetch another passenger, but unfortunately damaged his machine in alighting and was unable to get off again. So he is himself waiting to be rescued.

Relief expeditions are being organised by various countries. Major Maddalena and Major Penso have dropped various supplies for the camp without alighting.

A COURTESY VISIT.—Miss Earhart at the R.A.F. Station at Northolt on Sunday morning, whither she had flown in a Moth after an experimental flight at Stag Lane.

TO HONOUR SIR ALAN COBHAM.

On Tuesday, June 19, Sir Charles Cheers Wakefield gave a banquet at the Savoy in honour of Sir Alan and Lady Cobham and the crew of the Short Singapore on which they made their notable flight of survey round Africa.

Sir Charles, opening the proceedings, described Sir Alan as the recognised authority on commercial aviation in Africa on whose work all future air services will be based. Everywhere Sir Alan was received as our aerial ambassador.

Sir Samuel Hoare, rising to propose the health of Sir Alan and Lady Cobham, began by denying the rumour, which he said was prevalent in Downing Street and the House of Commons, to the effect that he was responsible for all the police trouble about Hyde Park. In explanation he quoted an hon. member as saying, "That dreadful fellow Sam Hoare is making Hyde Park impossible because he wants it for an aerodrome."

Referring to the Singapore's flight and the recent tour which he and the Lady Maud Hoare had made in the Short Calcutta, he said that they were examples of aerial domesticity.—(An American lady next one inquired at this point whether the Air Minister received flying pay when on his aerial jaunts.)

Sir Samuel said that all honour was due to Sir Alan Cobham and Mr. Worrall, his assistant pilot, and he paid a handsome tribute to the reliability of the machine and engines. We owed much also to Mr. Oswald Short, the great pioneer of seaplane work. His own experiences in the Calcutta had been very pleasant and he thought that it was easily the best civil flying-boat in the World. He believed that we were on the verge of great developments in flying-boats and flying-boat lines. The voyages of the Short Singapore and of the Supermarine Southamptons in the Far East Flight had been most valuable.

All the successful flights by Sir Alan Cobham were due to careful preparation. Every detail was carefully thought out. This applied to all successful flying. The Germans who flew the *Bremen* to Canada relied carefully on weather reports and reached Labrador. Sir Alan, he said, left nothing to chance. First of all he got the support of patriotic men like Sir Charles Wakefield, and then he worked out his plans.

The results of such flights did not end with the return of the machine. They would produce the Imperial air routes of the future. The Crown Colonies were already showing interest. The annual report by Mr. Evans, Chairman of the Crown Mines in the Transvaal, emphasised the economy which could be effected by transporting gold by air.

He, Sir Samuel Hoare, hoped to see soon a regular air route from North to South of Africa. The Government were trying to develop the England to India route and the next would be one to Cape Town.

The Lady Maud Hoare, presenting a handsome silver salver to Lady Cobham in commemoration of the flight, said that although she had flown a good deal, she regarded herself, having been merely a passenger, rather as an experienced parcel,—she objected to the term "baggage." Lady Cobham's great flight made her feel like an elder sister whose eye had been splendidly wiped. The only useful thing she, Lady Maud, had done on her flight to India had been to circulate a shoe-shine round the occupants of the machine just before reaching Karachi so that they could arrive properly resplendent, and that was a very small thing besides Lady Cobham's deeds during the voyage of the Singapore.

Women could at any rate set an example by going as passengers, even though their deeds were not always known to their friends. And she mentioned a good lady who had said to her recently, "I do so admire Lady Heath. I have the privilege of knowing Lady Bailey. Have you ever flown?"

Lady Cobham, who was looking very well in spite of her illness, in acknowledging the presentation, said that she supposed she was called upon to speak first because she had so much less to say than her husband. She said that she was not included in the crew of the Singapore until, encouraged by the example of Lady Maud in flying to India, she persisted in arguing the point with her husband. So she had to thank Lady Maud for her voyage.

She said that in crossing the Equator, her husband came into the cabin and said that some unusual ceremony was due and proceeded to kiss her in front of the crew. She suggested that the ceremony might have been more unusual if the crew had kissed her in front of him.

Becoming serious, she said how very glad she was to see round them that evening all the cheery faces of the very people who had seen them off on their journey. [One may perhaps be forgiven for remarking here that the first woman to fly across the Equator was Miss Auriol Lee, who did so in a Fairey III.D seaplane on one of Capt. Gladstone's experimental trips between Khartum and Kenya last year. One gathers that the room available in that machine did not permit of celebration of any kind.]

Sir Alan Cobham expressed his indebtedness to everybody concerned before, during and after the flight. When he proposed it, Sir Charles wanted to be assured that it was a utility flight and not a stunt. He, Sir Alan, believed that it had established the importance of British Aviation in Africa and it proved the metal flying-boat.

Thereafter he proceeded at considerable length, but without ever losing the attention of his audience, to relate incidents of the flight. The unhappy affair at Malta he described as a comic tragedy. (Actually one regards it as being the finest possible testimony to his determination. A lesser man would have given up in disgust before getting away from Malta.)

He told a quaint story of an event which also came near to being a tragedy. They flew over a herd of elephants near the Nile and, while endeavouring to point out to Mr. Bonnett, the kinematographer, just where they were, Capt. Worrall stuck his finger into an airscrew. He was lucky only to split the tip of his finger instead of losing his whole hand.

Sir Alan mentioned his flight from Mwanza to Khartum and back to demonstrate the necessity for big flying-boats on this route. He emphasised the fact that Capt. Tony Gladstone was the real pioneer of this route and that the valuable work he had done had not been wasted. He also bore witness to the pluck and perseverance of Mr. Robert Blackburn in backing this venture and announced that their and his interests were now amalgamated.

He mentioned his own tour of investigation on a Moth from Durban to Rhodesia and back while the Singapore was being cleaned up and overhauled at Durban.

Therafter he described the voyage along the desert coast-line from Cape Town up the West Coast, where he said there was nothing but fish and diamonds. He described the wonderful hospitality of the Portuguese at Porto Alexandre, Angola, and how they sent a gun-boat 700 miles to be of use if needed. He told also of the hospitality of the Belgians on the Congo, when Mr. Green fell sick and they sent a launch 50 miles down river, took him up to their hospital and operated on him at once, thus saving his life.

He said that the French at Libreville were equally hospitable. Their gifts were over-powering.

The first real trouble of the voyage, he said, was at Bonny, where they discovered a slight leak. On reaching Lagos the boat was lifted out and some damaged rivets which had caused the leak were closed up. Up to that point throughout the voyage, in spite of the handling at Malta, the hull of the Singapore had remained bone dry. The rivets must have been damaged at Malta and corroded thereafter.

He passed lightly over the radiator troubles which caused the delay in Fresco Lagoon, treating this as he treated all his troubles, lightheartedly.

Thereafter he thanked the Air Council for lending the boat, which he was proud to have delivered intact after a journey of 23,000 miles and an absence of seven months. It had been stripped in the Short Works at Rochester and everything was found to be as good as new. He remarked that after that nobody could say he did not know all about metal construction. Also he was glad for the sake of the British Insurance Group that he returned the boat safe and sound.

He paid a handsome tribute to Capt. Worrall and Messrs. Green, Conway, Bonnett, Nazer and Smith, who had served in the boat at one time or another during the journey.

Finally he spoke of the value of Lady Cobham's company on the journey and remarked that her value was all the greater because most of her views were entirely opposed to his own. He said that the only time there was peace was when they were in the air,—hastily explaining that this was not said in reference to Lady Cobham's views but to the fact that except when they were in the air they were either working on the machine or working at official receptions or propagandist work.

In conclusion, he said that without Sir Charles Wakefield the flight could never have been done. He was a man who believed in the importance of Aviation to the Empire. He thanked Rolls-Royce Ltd. and Short Bros. Ltd., and all those who helped them along the route, and also his partner Lieut.-Col. Warwick Wright and Capt. C. E. Ward of Alan Cobham Aviation Co. Ltd., who looked after things at home.

As a sort of postscript, he added that their tour of the British Isles had shown them how the country was waking up to aviation compared with people's outlook when he started touring the country six years ago.

Sir Harry Brittain, M.P., proposing the toast of Imperial Aviation, metaphorically spread a Union Jack out over the whole room and flapped it with vigour, much to the joy of the assembly. He said that Cobham was making English history. He asked whether we had an Empire Air Policy. He suggested that Cobham should be given Africa to be developed under the Union Jack. He said that we had got to get capital for Civil Aviation if we had to vaccinate the Treasury with the lymph of imagination.

Air Vice-Marshal Sir Sefton Brancker, replying, said he was not responsible for British Aviation. The person responsible was Sir Harry Brittain himself as a member of the House of Commons. It was up to him to put the House on the map of aviation. Sir Sefton said that the man with the biggest imagination in the Empire was Mr. Holt Thomas, who started air transport nine years ago, though the result of all his work was that owing to lack of support we now only had one small suburban air-line running.

Sir Alan Cobham, he said, was getting nearer to air routes. Private enterprise was going strong. Subsidised services were less successful. Air transport did not pay and the House of Commons was not air-minded. But air transport would pay if finances were improved. No country with a Wakefield could help being air-minded.

Our trouble was that we were suffering from a war complex. We thought of aviation with suspicion. We thought of bombs and not of civil transport. There were people who said, "Let us use other Nations' air lines and let them do the developing." He pointed out that Nations fell when they neglected their communications.

The British Aircraft Industry depended on Military Aviation. He hoped that now Nations were moving towards peace there would be less demand for war aircraft and consequently less orders. There was definitely a demand for civil aircraft and he hoped that within a few years we should find few firms building war machines and many building civil machines.

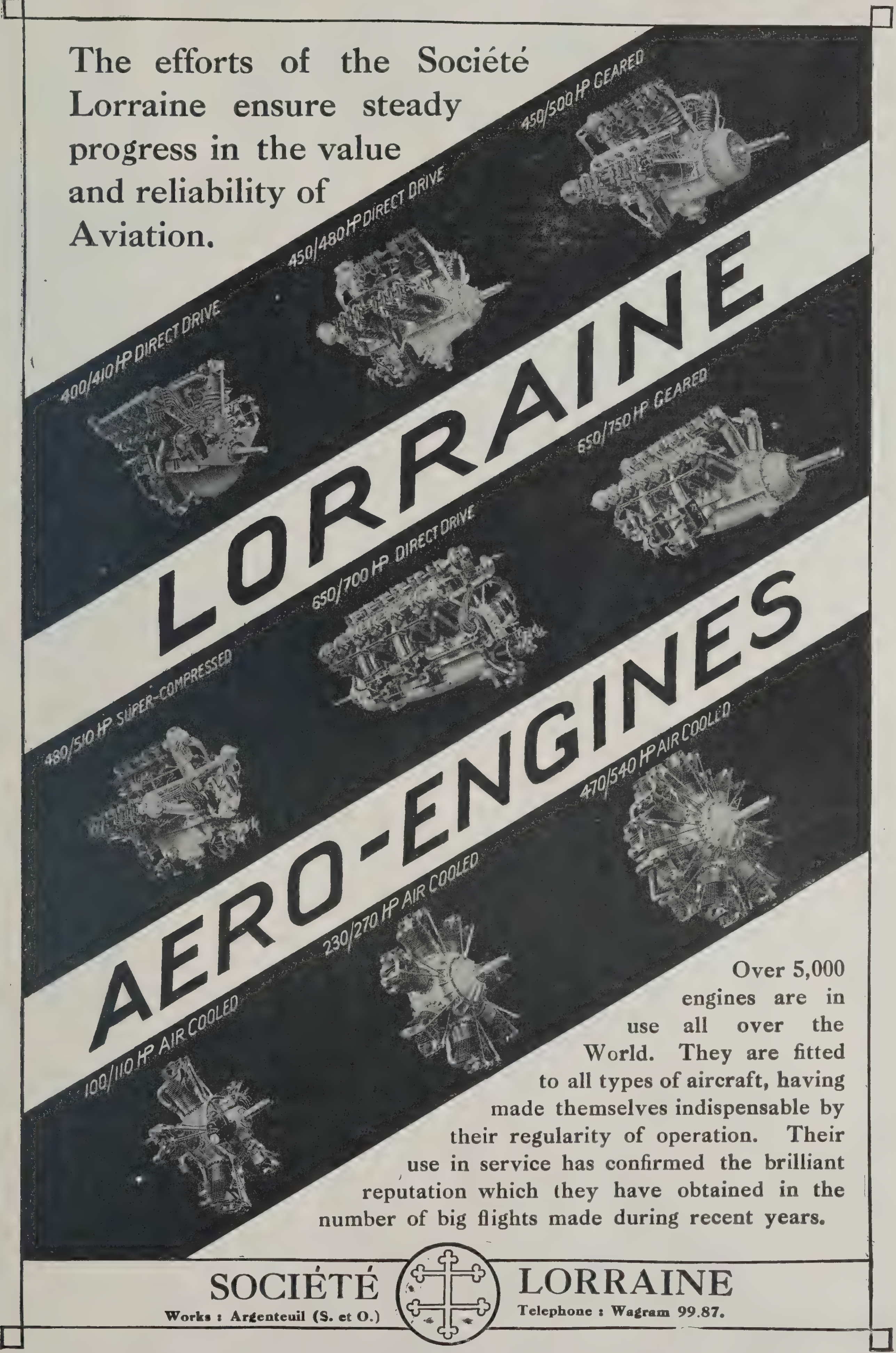
Sir Charles Wakefield proposed the toast of the guests, to which The Lord Mayor of London, Lady Heath and Lord Riddell replied.

Finally the toast of Sir Charles Wakefield, our host and chairman, was proposed by Lord Blanesburgh, who, in a short, sincere and touching speech, expressed the great indebtedness not only of British Aviation but of every British charitable institution to Sir Charles.—C. G. G.

THE FLIGHT TO INDIA.

The engine of the Fokker F.VII, in which Mr. C. D. Barnard and Mr. E. H. Alliott, with Her Grace the Duchess of Bedford as passenger, attempted to fly to India in four stages, has been sent to Cairo from Bushire for repairs and overhaul.

One gathers that the trouble was very similar to that which happened to Sir Alan Cobham at Athens on his flight to Australia. No benzol could be got at Sofia, and running on undiluted petrol caused detonation which damaged the interior of the engine.



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HISTORY AS WRITTEN.

The War in the Air, Vol. II. By H. A. Jones. Oxford, at the Clarendon Press. 508 plus xviii pages. 13 maps. Price 17s. 6d.

The second volume of the Official History begins with the Dardanelles Campaign, deals with operations on the West Front from November, 1914, to the fighting on the Somme in 1916, and describes the work of the Royal Naval Air Service in home waters in 1915 and 1916, including the air operations from Dunkirk and the doings of the bombing wing at Luxeuil, near Nancy.

The compilation of a war history is essentially a task for trained Staff Officers. And, because the Navy had no Staff College before the War 1914-18, and because the Royal Air Force had no Staff College until 1922, the logical conclusion is that any war history dealing with the operations of the Army during the War 1914-18 can only be done with the highest efficiency by soldiers. Without the necessary Staff training even the most experienced of fighting men cannot be expected to make a proper appreciation of the situation at any given moment during a war.

The enthusiastic Civil Servants, temporary and otherwise, who have been charged with the task of compiling the history of the Flying Services since the lamented death of Sir Walter Raleigh have undoubtedly done their best. The facts set forth in this volume, so far as they go, cannot be disputed. They are the result of much research through official documents of all kinds, from Cabinet Minutes down to the Combat Reports of inconsiderable flying men. But one is inclined to doubt the importance of the chosen facts in relation to the progress of the War as a whole.

Sincere efforts have evidently been made to show that the Royal Naval Air Service and the Royal Flying Corps did work in co-operation with the Navy and Army. Efforts also have been made to show the effect of our Flying Services on the German Navy and Army. The results of bomb-raids and attacks by aircraft on German troops have been got from German official reports, and so pilots who took part in certain specific operations may now discover for themselves just how much or how little damage they did. In fact, there is every indication that during the five or six years which have passed since the first volume of "The War in the Air" appeared the Staff of the Air Historical Branch have not spared themselves in their well-meant efforts to write authentic history.

Whether any given person enjoys reading history must depend on the temperament and education of the individual. There are those who find in the deliberately ponderous style of Gibbon and in his subtle humour the most exquisite entertainment. Its resemblance to the classic architecture of Rome has a peculiar charm. There are others who revel in the flamboyant style of Macaulay, which has been called the Regent Palace of Literature. Others again find in the English of the Hon. John Fortescue, as clear-cut as the architecture of a Georgian country house, the perfect design in the writing of history. "The War in the Air," to carry on the architectural simile, belongs to a style of which one does not wot. It strikes one as faintly reminiscent of Wembley,—without the Stadium.

On the opening page, laying out before the reader "the whole savage Gallipoli Peninsula," the author says that it "lies outstretched in the setting of a jewelled sea." On the second page he says, "The Island of Tenedos lies in the sparkling sea, . . . further West and bearing slightly South is the blurred outline of Lemnos; North-West, faintly pencilled, far beyond the coast of Imbros, stands snow-capped Samothrace." An officer with considerable experience of the sea and its ways remarked on reading these passages, "The author seems to have pre-judged the meteorological conditions."

On page 12 we find "The morning of the 19th of February saw the sun come up over the heights of Asia and flood with its brilliance the quiet sea and the sleeping hills." Apart from its reminiscence of that pathetic ballad, "And the mother and her child were there," this is really too much in the direct line of descent from a Victorian drawing-room ballad to be accepted as serious history. The facts of history may be dry, but that is no reason why the style should be wet.

In his Preface Mr. H. A. Jones, in a sincere desire to do honour to his late chief, says that he "was privileged to work in close touch with Sir Walter Raleigh on the first volume. To be with him was an education. Those who knew Sir Walter best may find many traces of his influence throughout this book." One can only suggest that the word "*may*" might have been printed in italics.

Ordinary history must necessarily resemble that delectable dish known as toad-in-the-hole, in which solid chunks of meat are embedded in batter. The acceptability of this dish depends necessarily on the amount and quality of the meat, and still more on the constitution of the batter. Some of the meat may be very solid, but it can be made pleasing and digestible by skilful cooking. Where this air history fails is undoubtedly in the cooking and in the quality of the batter.

The facts are presented far too much as if they were written for the daily Press and not for serious students of history. Far too much attention is given to reports of individual combats and exploits. And these are told with a wealth of adjectives and adverbs which is more journalistic than literary. One realises almost with surprise, after a series of gallant and valiant and heroic and such-like air fights, that one has not actually read of the "heroic birdman" beloved of journalists.

Apart from this unfortunate general outlook, the author's style is free from the more obvious defects. He does not split his infinitives, he does not write "and which," and he does not end his sentences with prepositions. But he does write "since" when he means "because." Still, one would have forgiven him any quantity of split infinitives and such-like crimes if only he would have avoided these periodical outbursts of emotionalism and other manifestations of the artistic temperament.

He has certain other irritating tricks also. Among them is that of calling His Majesty's ships by their names without the prefix "the." This, one gathers, is not done by the best people in the Navy, but only by those like the individual of whom Mr. Emanuel Pyecroft said, "You can tell he is a civilian from the way he tries to talk Navy talk."

Many readers will be irritated at reading in one sentence "The *Ark Royal* got to work at once on the day of her arrival," and in another "And, since the engines of *Ark Royal's* seaplanes were unreliable, the pilots had often to fly with one eye on the water."

In one paragraph appears "The bombardment of the inner defences began on the 5th of March, and *Queen Elizabeth* was expected to take the leading part." Later in the same paragraph we read "The *Queen Elizabeth* was anchored South-West of Gaba Tepe."

Another horribly irritating trick is the method of printing dates, thus: "A letter of the 15th of February." "On the 13th of January 1915," and so on all through the book.

Still, there is a lot of meat in the pudding in the way of solid historical facts. And, as those facts cannot be got anywhere else, those who want their children to know what Daddy did in the Great War as a flying man must perforce buy this Official History. Also, there is quite a good deal of entertainment to be got out of reading about the aerial escapades during the War of those who are now among the Great Great Ones of the Royal Air Force.—C. G. G.

VIEWS AND REVIEWS

THE WAR IN THE AIR. Volume II.
H. A. JONES. (Official History). Post free, 18/-
"The facts set forth in this volume, so far as they go, cannot be disputed. They are the result of much research throu h official documents of all kinds, from Cabinet Minutes down to the Combat Reports of inconsiderable flying men."
C. G. G. in *The Aeroplane* of June 27.

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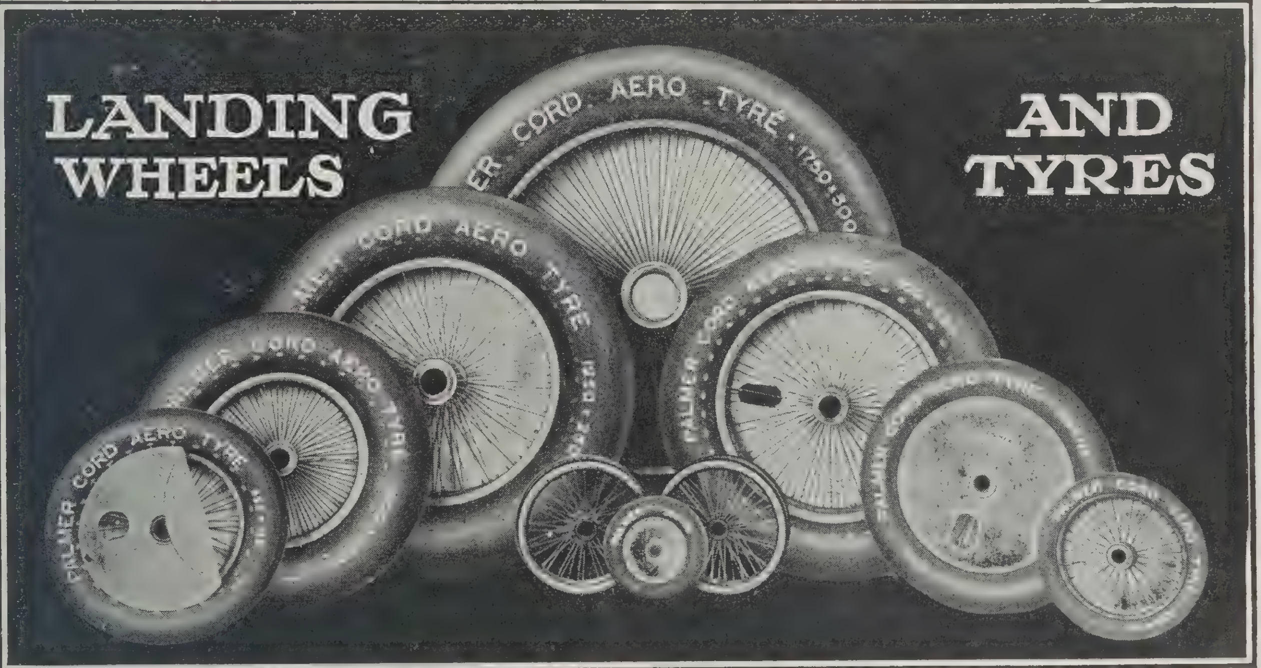

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375 × 55	168	111.12	25.4	Central
300 × 60	16	111.12	25.4	Central
450 × 60	30	89.	31.75	Central
,,	172	130.	38.09	Central
575 × 60	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	90	150.	38.09	Central
650 × 65	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
600 × 75	21	160.	28.	Central
,,	180	150.	38.09	104/46
,,	186	120.	34.92	Central
,,	190	150.	38.09	Central
700 × 75	78	178.	44.45	132/46
,,	79	178.	44.45	Central
,,	100	178.	38.09	132/46
,,	101	178.	31.75	132/46
700 × 100	77	178.	44.45	132/46
,,	92	185.	55	135/50
,,	95	185.	55.	Central
,,	99	178.	38.89	132/46
700 × 100	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55	132/46
650 × 125	119	178.	55.	132/46
,,	147	178.	55.	Central
,,	188	120.	34.92	Central
750 × 125	77	178.	44.45	132/46
,,	92	185.	55.	135/50
,,	95	185.	55	Central
,,	99	178.	38.89	132/46
,,	112	150.	38.09	Central
,,	176	178.	44.45	Central
,,	179	178.	55.	132/46
800 × 150	161*	185.	55.	135/50
,,	162*	185.	55.	Central
,,	163*	185.	66.67	135/50
,,	169†	185.	55.	135/50
,,	177	185.	55.	135/50
,,	183	185.	55.	Central
,,	211*	185.	60.32	135/50
1000 × 150	167	185.	55	125/60
,,	174	250.	80.	Central
,,	182	185.	55.	Central
,,	187	220.	66.67	Central
,,	201	185.	60.32	125/60
1000 × 150	210	185.	60.32	Central
1000 × 180	148	220.	80.	Central
,,	149	185.	55.	Central
,,	155	220.	66.67	Central
,,	166	185.	55.	125/60
900 × 200	107	185.	55.	Central
,,	108	185.	55.	125/60
,,	128	220.	66.67	Central
,,	137	250.	80.	Central
,,	157	185.	80.	Central
,,	202	185.	60.32	Central
1100 × 220	134	220.	66.67	Central
,,	136	250.	80.	Central
975 × 225	192	185.	60.32	Central
,,	194	185.	55.	125/60
1250 × 250	133	250.	80.	Central
,,	154	304.8	101.6	Central
1500 × 300	115	304.8	101.6	Central
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ANALYSIS OF FIGURES FOR THE PAST WEEK

Trips per Day.—Sunday, 15; Monday, 35; Tuesday, 30; Wednesday, 32; Thursday, 36; Friday, 35; Saturday, 38.

Imperial Airways Ltd.:
London—Paris—Zurich; London—Ostend—Brussels—Cologne and return: Machines 99, passengers 755, freight 25 tons.

Air Union:
Paris—London and return: Machines 45, passengers 212, freight 15 tons.

K.L.M.:
Amsterdam—Rotterdam—London and return: Machines 27, passengers 186, freight 6 tons.

Sabena:
Brussels—London and return: Machines 14, passengers 52, freight 2 tons.

Deutsche Lufthansa A.G.:
Amsterdam—London and return: Machines 22, passengers 46, freight 3 tons.

Private:
Machines 14, passengers 27.

Total number of trips by British Machines, 109, carrying 778 passengers. Foreign Machines, 112, carrying 500 passengers.

COMPARATIVE FIGURES.

Week ending June 23:
Machines, 221; Passengers, 1,278; Crews, 425; Total personnel, 1,703.

Corresponding week, 1927:
Machines, 154; Passengers, 1,090; Crews, 253; Total personnel, 1,343.

Corresponding week, 1926:
Machines, 166; Passengers, 984; Crews, 214; Total personnel, 1,198.

Corresponding week, 1925:
Machines, 178; Passengers, 773; Crews, 219; Total personnel, 992.

Corresponding week, 1924:
Machines, 148; Passengers, 585; Crews, 183; Total personnel, 768.

Corresponding week, 1923:
Machines, 131; Passengers, 473; Crews, 218; Total personnel, 691.

Corresponding week, 1922:
Machines, 126; Passengers, 260; Crews, 173; Total personnel, 433.

Corresponding week, 1921:
Machines, 102; Passengers, 381. Crews, 123; Total personnel, 504.

Corresponding week, 1920:
Machines, 113; Passengers, 221. Crews, 134; Total personnel, 355.

Croydon Notes.

Mr. Van Lear Black's journey from Croydon to the *"Rallye Aérienne"* at Reims on Saturday, June 16, mentioned in these notes last week, was a remarkably fine performance on the part of the Fokker FVII and its pilot, Mr. Geyssendorffer. Carrying seven passengers and 188 lbs of baggage the machine left Croydon at 06.10 hours, landed at Nürnberg at 10.25 hours, took off after 15 minutes, reached Paris at 15.12 hours, left again at 15.18 hours, and reached Reims at 16.05 hours, having taken in no extra fuel on the way.

The total distance is just about 1,000 miles, and the overall speed, including stops, is over 100 m.p.h. Allowing for stops the speed must have been about 105 m.p.h.

The officials at Reims were quite unable to announce the results of the competition for which this flight was made, though they were able to opine that Mr. Black's trip would rank as third, and after waiting at Reims till Tuesday without receiving any definite statement as to the winners of the contest, Mr. Black flew to Paris on Tuesday to stir up the French Aero Club, and returned to Croydon on Wednesday, with his pardonable curiosity still unsatisfied.

The secrecy previously maintained as to Imperial Airways' new machines dissolved during last week, and it is now officially announced that the three new Argosies mentioned in these notes last week are now on order.

The new machines will differ from the present Argosies in a number of details Each will be fitted with three of the new geared Jaguar engines, which should give a notable increase in performance. The seating arrangements will be slightly changed, the steward and his pantry will go forward, and room will be provided for twenty passengers over and above the steward.

Efforts will be made markedly to reduce the noise in the cabin—and generally to give a still further degree of comfort, and it is said that fuel tanks for a larger range are to be fitted.

Apart from these details the new machines will resemble the existing Argosies very closely, and every effort is being made to secure as large a degree of interchangeability in components as possible. [One hopes that they will mark much greater development in the design of commercial aircraft than is indicated in these notes. The existing Argosies were a step forward in the days when they were built. But many steps in knowledge have been made since then.—C. G. G.]

Mr. Wilmer Stultz and Mr. Gordon, the crew of the Fokker seaplane which brought Miss Earhart across the Atlantic, visited Croydon on June 21, and were greatly impressed by the lay-out of the aerodrome. Those who had an opportunity of meeting them received the impression that their flight was made under exceedingly unpleasant conditions, and that only first-rate navigation could have made it a success.

Joy-riding seems to be a paying line at Croydon. On Sunday evening two Avros belonging to Surrey Flying Services were going up and down alternately, with the regularity of hotel lifts, and with greater certainty than the lift with which this office is afflicted.

The Fokker, with three Lynx engines, purchased by Mr. Holt, reached Croydon from Amsterdam on Saturday, June 23, piloted by Mr. R. H. Macintosh, and bringing two passengers. It bears the Dutch registration H-NAEL, but this may, as in the case of Mr. Lowenstein's machine, only be a temporary matter.

Since the subject of the British naturalisation of Mr. Lowenstein's machine was the subject of inquiry in this column a week or two ago, an explanation which may be considered accurate in all respects has been received.

A civil machine which already has a certificate of airworthiness in the country of its origin, on passing to British ownership may have its foreign C. of A. validated by the British Air Ministry, provided that the issuing country is a member of the I.C.A.N. This does not mean that the Air Ministry takes any responsibility for that machine's airworthiness, nor will a fresh C. of A. necessarily be issued for that machine at the end of the first year's currency of the original certificate.

THE FLYING CLUBS.

The London Aeroplane Club.

[Sec.: Harold Perrin, 3, Clifford Street, London, W.1.]

Report for week ending June 24.

Flying Time 55 hr. 55 min. *Instruction* 33 hr. 25 min. *Soloists* 22 hr. 30 min. *Soloists.*—Messrs. A. S. Miller, H. M. Samuelson, R. Sanders Clark, J. A. Brewster, F. C. Fisher, Art. Fowler, H. B. Michelmore, S. M. Nesbitt, Will Hay, E. E. Stammers, J. C. V. K. Watson, W. Roche-Kelly, J. J. Hofer, P. W. Hoare, Major R. M. S. Veal, Major Beaumont. *Instruction.*—Miss Wilson, Miss H. Cholmondeley, Miss Fletcher, Messrs. C. Reilly, B. Carey, C. Peckham, E. H. Thierry, C. W. Bonniksen, H. Sutton, H. R. Presland, P. A. Wills, D. H. Corsellis, J. R. Rymill, G. E. Clair, E. G. Amsden, E. A. Lingard, J. R. A. Stroyan, J. A. Crane, A. J. Miller, R. Drysdale Smith, A. O. Wigzell, R. F. G. Adams.

The Royal Air Force Display.—In view of the large number of Service aircraft which will be employed at Hendon Aerodrome in connection with the Royal Air Force Display and the fact that Stag Lane Aerodrome will also be used to accommodate Service aircraft, the Club will be closed down on June 29 and June 30.

The Newcastle-upon-Tyne Aero Club.

[Sec.: J. T. Dodds, Cramlington Aerodrome, Northumberland.]

Report for week ending June 17.

Flying Time 30 hr. 5 min. including 7 hr. 20 min. at Birmingham *Instruction* 8hr. 35 min. *Soloists* 5 min. *"A" Pilots* 9 hr. *Passenger Flights* 3 hr. 5 min. *Instruction.—With Mr. J. D. Parkinson*—Mrs. Kish, Miss Trevelyan, Messrs. Nicholls, Maxwell, Linden Bell, Mackay, Temple, Lawson, Fairless, Percy, Dodds. *Soloist.*—Mr. Maxwell. *"A" Pilots.*—Mrs. Heslop, Messrs. H. Ellis, C. Thompson, R. N. Thompson, A. H. Bell, C. Wilson, Dr. Dixon, J. T. Percy, F. L. Turnbull, W. B. Ellis. *Passengers.*—23 *Tests.*—30 min.

A large crowd gathered on the Aerodrome last Friday to await the arrival of Imperial Airways Argosy, "City of Glasgow." Mr. J. D. Parkinson entertained the people with an exhibition of Aerobatics, after which, in company with Dr. Dixon, some excellent photographs were obtained.

Report for week ending June 24.

Flying Time 30 hr. 50 min. *Instruction* 9 hr. 45 min. *Soloists* 1 hr. 15 min. *"A" Pilots* 15 hr. 5 min. *Passengers* 3 hr. 45 min. *Tests* 1 hr. *Instruction.—With Mr. J. D. Parkinson*—Miss Slade, Mrs. Kish, Messrs. Bohane, MacKay, Kendrick, Alton, Temple. *Secondary Duel.*—Mr. Glenny. *Soloists.*—Mr. Jackson. *"A" Pilots.*—Mrs. Heslop, Messrs. H. Ellis, Heppell, W. B. Ellis, R. N. Thompson, C. Thompson, Turnbull, Lloyd Browne, Runciman, Irving, N. S. Todd, Dr. Dixon, Dr. Alderson.

This week we have sampled a portion of the atrocious weather which seems to fall to the lot of the Yorkshire Club, but we take this opportunity of thanking them for their hospitality on the occasion of our cross-country training flight on Wednesday last, from Cramlington to Sherburn, and return via Catterick. The party consisted of the three Club Moths, and Miss Leathart's Grasshopper.

On Saturday Mr. Jackaman, flying his Moth G-EBRT, called at the Aerodrome.

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The Yorkshire Aeroplane Club.

[Sec.: Lt.-Col. J. Walker, The Aerodrome, Sherburn-in-Elmet.]

Report for week ending June 23.

Flying Time 22 hr. 25 min. *Instruction* 11 hr. 50 min. *Soloists* 8 hr. 15 min. *Passengers* 2 hr. 20 min. *Instruction.—With Mr. Beck*—Miss Woodhead, Messrs. Ambler, Armitage, Bell, Birch, Blackburn, Brown, Collins, Dujardin, Lupton, Parks, Reynolds, Rowley, Seed, Upton, Watson, Wayman. *Soloists.*—Messrs. Armitage, A. Crowther, Dick, Reynolds. *"A" Pilots.*—Messrs. Birch, Clayton, H. Crowther, Ellison, Humpheries, R. Lax, Norway, Thomson. *Passengers.*—14.

Cold, strong winds have prevailed during the whole week. We got no flying on Sunday, our best day, but on Wednesday we managed to put in 8½ hours.

On Tuesday, Mr. Armitage, a new member, put up a very pretty show on his first solo on Bluebirds, and on Wednesday Mr. Arthur Crowther managed his height test after waiting several weeks.

Two private owners visited us this week, namely Mr. Cooper and Mr. Jackaman. On Wednesday the Newcastle Club honoured us with a visit for lunch *en masse* with four kites. It struck one as showing a true neighbourly spirit and also a diversion for the members from the somewhat monotonous routine of sailing round the aerodrome, and should prove of great value in advancing members' experience in cross-country and formation flying We hope to pay a return visit in the near future.

The Midland Aero Club.

[Sec.: Gilbert Dennison, Villa Road, Handsworth.]

Report for week ending June 9.

Flying Time 28 hr. 3 min. *Instruction.—With Flt. Lt. T. Rose, D.F.C., and Mr. Sutcliffe*—16. *Soloists.*—11. *Passenger Flights.*—16.

On Sunday Mr. R. C. Baxter was launched solo A new record for one day's total flying was established on Sunday, when 15½ hours was completed.

Report for week ending June 16.

Flying Time 30 hr. 43 min. *Instruction.—With Flt. Lt. T. Rose, D.F.C., and Mr. W. H. Sutcliffe*—17. *Soloists.*—15. *Passenger Flights.*—9.

During the week Messrs. S. Duckitt and N. Nesbit were launched solo.

Report for week ending June 23.

Flying Time 47 hr. 44 min. *Instruction.—With Flt. Lt. T. Rose, D.F.C., and Mr. W. H. Sutcliffe*—21. *Soloists.*—19. *Passenger Flights.*—18.

On Sunday Messrs. E. P. Lane and S. G. Hall passed all tests for their "A" Licences, and on Thursday Mr. G. E. C. Hill successfully made his first solo.

The Club created a new record for total hours flown this week, exceeding its previous record by seven hours.

The Hampshire Aeroplane Club.

[Sec.: H. J. Harrington, The Aerodrome, Hamble.]

Report for week ending June 24

Flying Time 31 hr. 45 min. *Instruction* 14 hr. 5 min. *"A" Pilots* 8 hr. 15 min. *Soloists* 6 hr. *Passenger Flights* 2 hr. 40 min. *Tests* 45 min. *Instruction.—With Flt. Lt. Swoffer*—24. *"A" Pilots.*—10. *Soloists.*—8. *Passengers.*—16.

Miss Grace successfully completed her tests for her "A" Licence this week, and is our first lady pilot to take her Licence. This brings our total of "A" Licence members up to 39. On Wednesday Flt. Lt. Swoffer flew the Avian to Bournemouth, landing on the racecourse, to give dual instruction to some of the Bournemouth members. It is hoped that this will be possible every week, and that thus, in time, a club in this town may be formed.

Considerable excitement prevailed at the Club on Monday and Tuesday when Capt. Guest and party arrived to welcome Miss Earheart. Machines arrived at all times during the day, with members of the Press.

We thought we had one of the largest aerodromes in the country, but Mr. Scott-Hall does not think so apparently, for when landing, thinking he might over-run, went through a barbed-wire fence with a Moth. We have some spare barbed-wire, but unfortunately no new bottom planes, so that the machine is held up.

Sunday was a fine day. It would be. We had one machine.

The Norfolk and Norwich Aero Club.

[Manager: Basil Young, The Aerodrome, Sprowston.]

Report for week ending June 24.

Flying Time 15 hr. 20 min. *Instruction.—With Mr. Young*—Messrs. C C. White, A. G. Woods, H. Cator, G. Wharton, H. P. Clarke, C. Ransome, A. G. Lofty, C. Corsellis, T. Image, W. A. Palmer, F. Rinder. *Soloists.*—Messrs. R. F. Potter, R T. Harmer, N. Brett, A. Cooper, F. Gough, H. P. Clarke, A. G. Lofty, E. Varden Smith, G F. Surtees, G. Barker, W. P. Cubitt, R. Moore. *Passengers.*—22.

Messrs. R. Moore and N. A. Brett have been drawn to fly to Hendon on Saturday and as everybody appears to be going this year the Club will be closed down. On July 5 Messrs. F. Gough and G. F. Surtees will wing their way to Blackpool in readiness for the big pageant of the Lancashire Club

On Saturday evening to encourage the flying feeling our Mr. Young flew over to Diss, where a gymkhana was in progress, and executed a few sky antics.

On Sunday Mr. Gough gave an excellent exhibition of crazy flying on his "53," gracefully shearing a sheep with his wing-tip when landing. Our Ground Engineer has been awarded the title of Chief Shepherd and granted a shepherd's "A" Licence. His solos are splendid. He zooms out of the hangar, chases all the sheep out of sight, and returns to find bullocks inspecting the machines, and they need plenty of tact to deal with.

We are pleased to record the first solo of Capt. H. Piers Clarke who after four hours' training gave an excellent display.

The Suffolk and Eastern Counties Aeroplane Club.

[Sec.: Major P. L. Holmes, D.S.C., The Aerodrome, Hadleigh, Suffolk.]

Report for week ending June 23.

Flying Time 21 hr. 15 min. *Instruction* 10 hr. 50 min. *"A" and "B" Pilots* 1 hr. 20 min. *Soloists (under instruction)* 5 hr. 40 min. *Passenger Flights* 2 hr. 50 min. *Tests* 35 min. *Passengers.—With Mr. Lowdell*—12. *With Mr. Prentice*—1. *Instruction.—With Mr. Lowdell*—Dr. Mildred Yate, Miss Edwards, Miss Rhodes, Dr. Dunn, Messrs. Goodwin, G. Smith, Jolly, T. and B. F. Marriage, Peck and Wedd. *Soloists (under instruction).*—Miss Edwards, Messrs. Verney, G. Smith, Hanson, Jolly, Billinton and Peck. *"A" and "B" Pilots.*—Dr. J. C. Sleigh, Mr. C. N. Prentice and Flg. Off. Birt.

The week under review has been the busiest in the history of the Club. Fine weather. Two machines in commission and a slight increase in airmindedness in East Anglia have contributed towards this happy end. The flying hours have been about the figure they should be each week and it is to be hoped that they will continue to increase. We have all the facilities for flying possessed by any other club, so that our low figures are proof that new members can, if they care to attend regularly at the aerodrome, learn to fly very quickly.

Mr. F. Verney has completed his tests for his "A" Licence, while Messrs. H. Billinton and C. Hanson have completed their eights.

The R.A.F. have let the Army down. The Club has been asked to arrange an air display in co-operation with troops of the 4th Division at the Colchester Pageant on July 19, in aid of various charities. This is one of the most important annual events in the Eastern Counties and attracts a very large crowd, thus it is a splendid opportunity to arouse interest in private flying.

The Norfolk and Norwich Aero Club hope to co-operate with us in making this event a success. The organisers hope to assemble about 12 light aeroplanes on the military aerodrome at Colchester and the co-operation of private owners and aircraft constructors will be very welcome. Further particulars can be obtained from the Secretary.

The Bristol and Wessex Aeroplane Club.

[Sec.: C. F. G. Crawford, Filton Aerodrome, Bristol.]

Report for week ending June 23.

Flying Time 16 hr. 15 min. *Instruction* 9 hr. 15 min. *Soloists* 3 hr. 15 min. *Passengers.*—11 *Flights*—2 hr. 40 min. *Cross-country Flight.*—Filton—Ramsgate. *Instruction.—With Mr. Bartlett*—Messrs. Amory, Greenhill, Allinson, Davis, Tinson, Hughes, Thomas, Godfrey, Lysaght, Chopra, Girdlestone, T. H. Clarke, Byrnes, Laws, Suddes. *"A" Pilots.*—Messrs. Downes-Shaw, Bathurst, Hall, Tratman and Jopp.

Mr. A. H. Downes-Shaw started for Ramsgate on Friday in his private Moth. He is expected back on Sunday, 24th.

Mr. A. P. Godfrey re-qualified for "A" Licence during the week.

The Cinque Ports Flying Club.

[Hon. Sec.: R. Dallas Brett, 114, High Street, Hythe, Kent.]

Report for week ending June 23

Flying Time 13 hr. 20 min. *Test Flights* 20 min. *Instruction.—With Mr. Clarke*—Mr. Braddell, Miss Allen, Miss Tegart, Mr. Story, Mr. West, Capt. Took, Mr. K. Edgson Wright, Mr. Douglas, Capt. Took. *Joy-ride.—With Mr. Clarke*—Miss Joy Upton. *Soloists.*—Mr. West, Capt. Took, Mr. Story, Mr. R. Dallas Brett, Mr. K. Edgson Wright, Mr. Douglas.

On Wednesday, June 20, Mr. R West, of the Guards' Depot, Canterbury, did an excellent first solo, including two very good landings. He had 7 hr. 45 min. dual instruction. This was an excellent show. The next day, Thursday, was unfortunate. Capt. G. E. Took was launched solo after 9 hr. 45 min. dual instruction. He did one circuit and made a good landing, but the next time he was unfortunate enough to land on the edge of a shallow depression, which disfigures the Northern edge of our aerodrome. When our Moth had been restored to a normal position, it was found that, among other things, a new rudder, two new top planes and centre section struts were needed.

The Club's thanks are due to our Ground Engineer, Mr. R. H. Wynne, who laboured mightily with some borrowed assistance, for which the Club is also grateful. Had it not been for some misunderstanding in ordering spares, the machine would have been flying again on Saturday afternoon—remarkably smart work.

The First General Meeting of the Members was held on Wednesday night, and a new Committee was elected, consisting of Maj. C. F. Krabbe, O.B.E., of Dymchurch; Lt.-Cdr. Gubbins, R.N. (Rted.), of Canterbury; Lt. A. V. C. Douglas, of Canterbury; Capt. G. E. Took, of Dover; Mr. K. Edgson Wright, of Ashford; Mr. Stuart Lewis, of Postling; Mr. M. S. Faraday, of Canterbury; Mr. W. H. Evernden, of Faversham; Mr A. W. Hunt, of Dover; Mr. H. E. Twaites (Hon. Treasurer), of Hythe; and Mr. R. Dallas Brett (Hon. Sec.), of Hythe.

We had the pleasure of making the acquaintance of Mr. Downes-Shaw, Chairman of the Bristol Club, on Saturday, when he arrived in his Moth S.T.

The Nottingham Aero Club.

[Sec.: C. R. Sands, Hucknall Aerodrome, Notts.]

Report for week ending June 22.

Flying Time 27 hr. 40 min. *Instruction* 13 hr. 35 min. *"A" Pilots* 2 hr. *Soloists (under instruction)* 8 hr. 50 min. *Passenger Flights* 1 hr. 50 min. *Tests* 1 hr. 50 min. *Instruction.—With Mr. Martin*—Miss Bostock, Messrs. Selvey, Bradley, F. Hatton, Taylor, Shipside, Glenn, McWilliam, Hancock, Calladine, Lucas, S. Hatton. *"A" Pilots.*—Messrs. Blake, Hallam, Cox, Ball. *Soloists (under instruction).*—Messrs. Selvey, Bradley, Glenn, D. Pilgrim. *Service Pilots.*—Messrs. Spaight, S. Hatton. *Passenger Flights.—With Mr. Martin*—Mrs. Selvey, Miss Flinders, Miss Matthews, Messrs. Thirlby, Linsley, Bradley, Fitzpatrick. *With Mr. A. C. Ball*—Mr. Cottrell.

Congratulations to Messrs. Bradley, Selvey and Glenn, who are now soloists and who put up excellent shows. Also to Mr. B. Pilgrim, who successfully passed his tests for his R.A.C. ticket, doing his height tests well up in the clouds, and also to Mr. Harold Ashworth, for having the distinction of being our first private owner. He is one of our recent *ab initio* pilots and has brought a smart Avian.

Mr. Martin, our instructor, flew with Mr. Ashworth from Woodford Aerodrome on Friday last to Hucknall in 22 min. (58 miles).

We also extend our warmest greetings to Miss M. Bostock for having the distinction of being our first lady pilot member.

Since the Bristol Air Pageant to the end of May, we have experienced a run of bad luck, due entirely to circumstances over which we had no control. However, we have now two kites doing great work since June 1, and we have been full out.

PERSONAL NOTICES.

DEATHS.

ALDRIDGE.—On June 20, while flying at Wei-hai-wei, Lieut. Raymond Arthur Aldridge, R.N. (Flg. Off., R.A.F.), 403 (Fleet Fighter) Flight, H.M.S. *Hermes*, China, eldest and most dearly beloved son of Arthur and Claire Aldridge, aged 27, Pachesham Gates, Leatherhead, Surrey.

Mr. Aldridge was detached from the Navy for service with the R.A.F. in January, 1925, and joined No. 403 (Fleet Fighter) Flight in H.M.S. *Hermes* in December, 1927.

NICHOLSON.—On June 25, at Malta, John Nicholson, Lieut., R.N., Flg. Off., R.A.F., No. 463 (Fleet Torpedo) Flight, H.M.S. *Courageous*.

Mr. Nicholson was detached from the Navy for service with the R.A.F. in April, 1925, and joined No. 463 (Fleet Torpedo) Flight in H.M.S. *Courageous* in September, 1927.

MARRIAGE.

JOYCE CLARKE—RENDLE.—On June 16, at Compton Church, Surrey, Thomas Joyce Clarke, R.A.F., of Wayste Court, Abingdon, to Kathleen Rendle, of Highfield, Godalming.

BIRTHS.

MONK.—On June 22, at The Tower, Pool-in-Wharfedale, Yorkshire, to Carine, wife of Harold de Baillou Monk, M.C., A.F.C.—a daughter.

SALMOND.—On June 22, at 27, Chester Terrace, Regent's Park, the wife of Air Marshal Sir John Salmond—a daughter.

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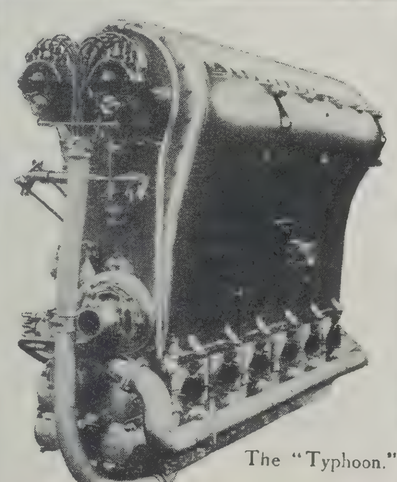

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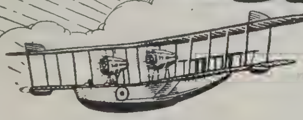

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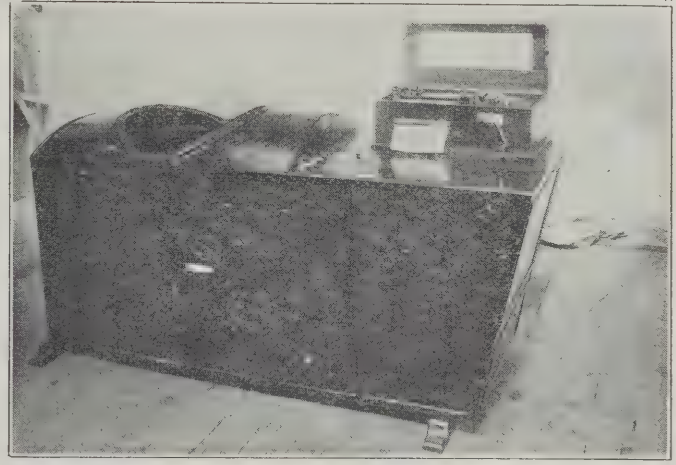

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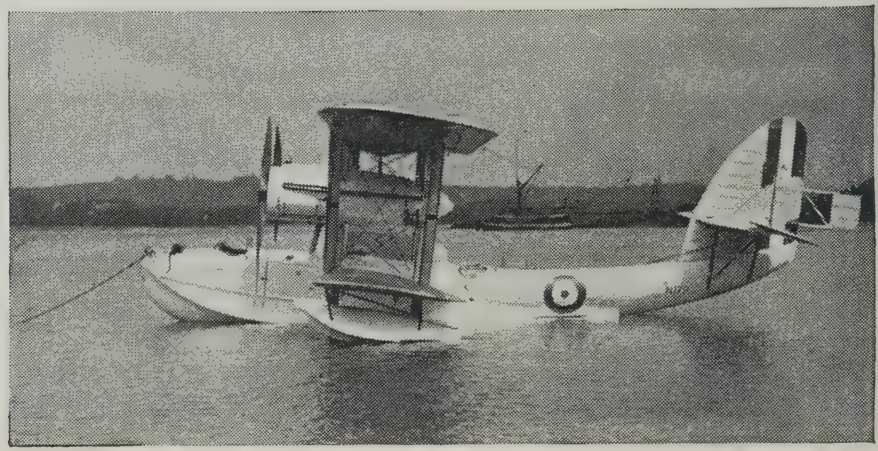

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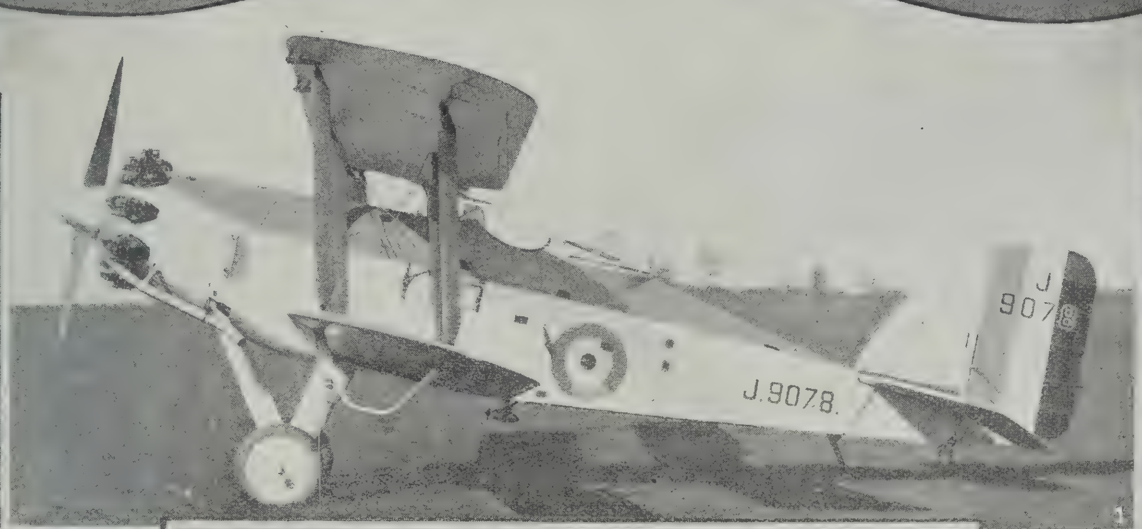
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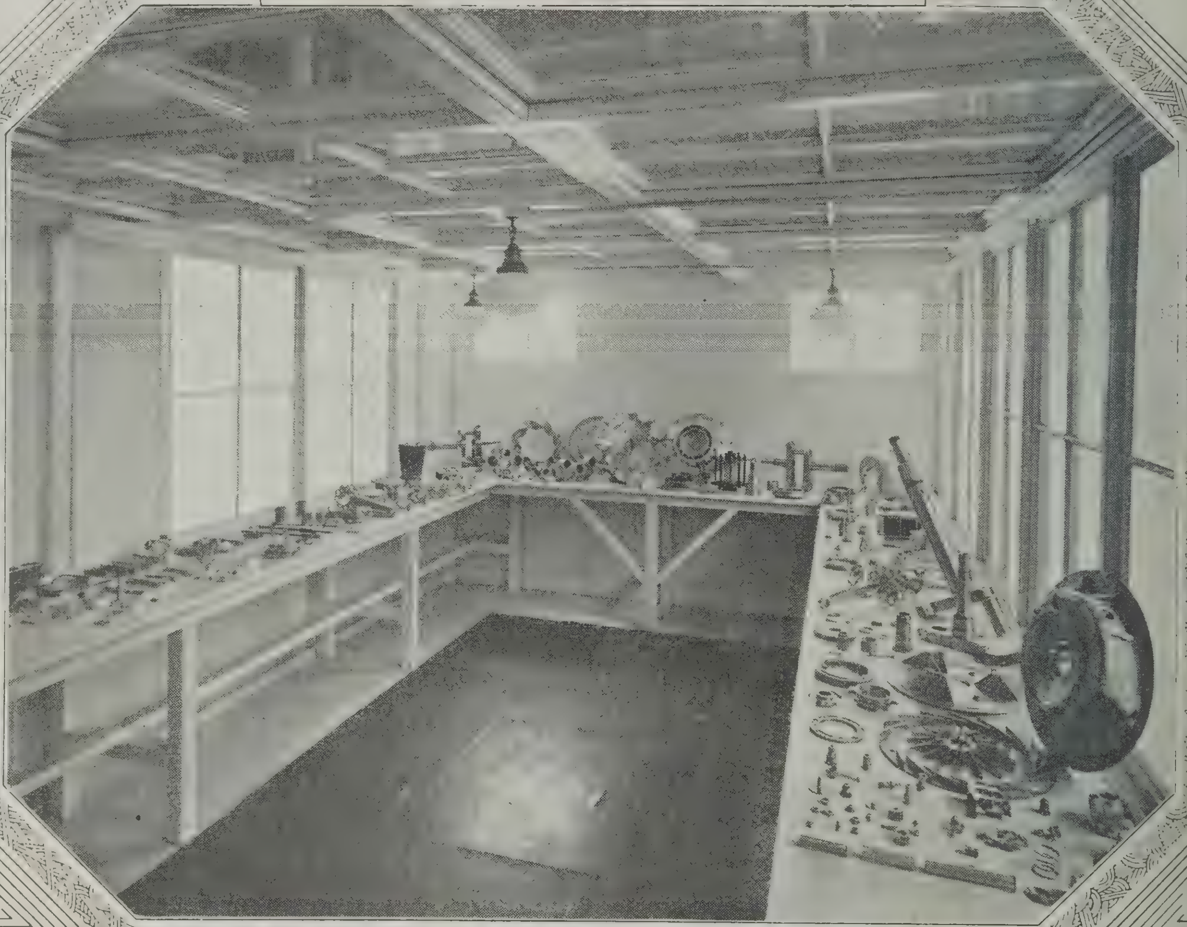

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EDITORIAL OFFICES OF "THE AEROPLANE," 175, PICCADILLY, LONDON, W.1.
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